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NetworkWorld

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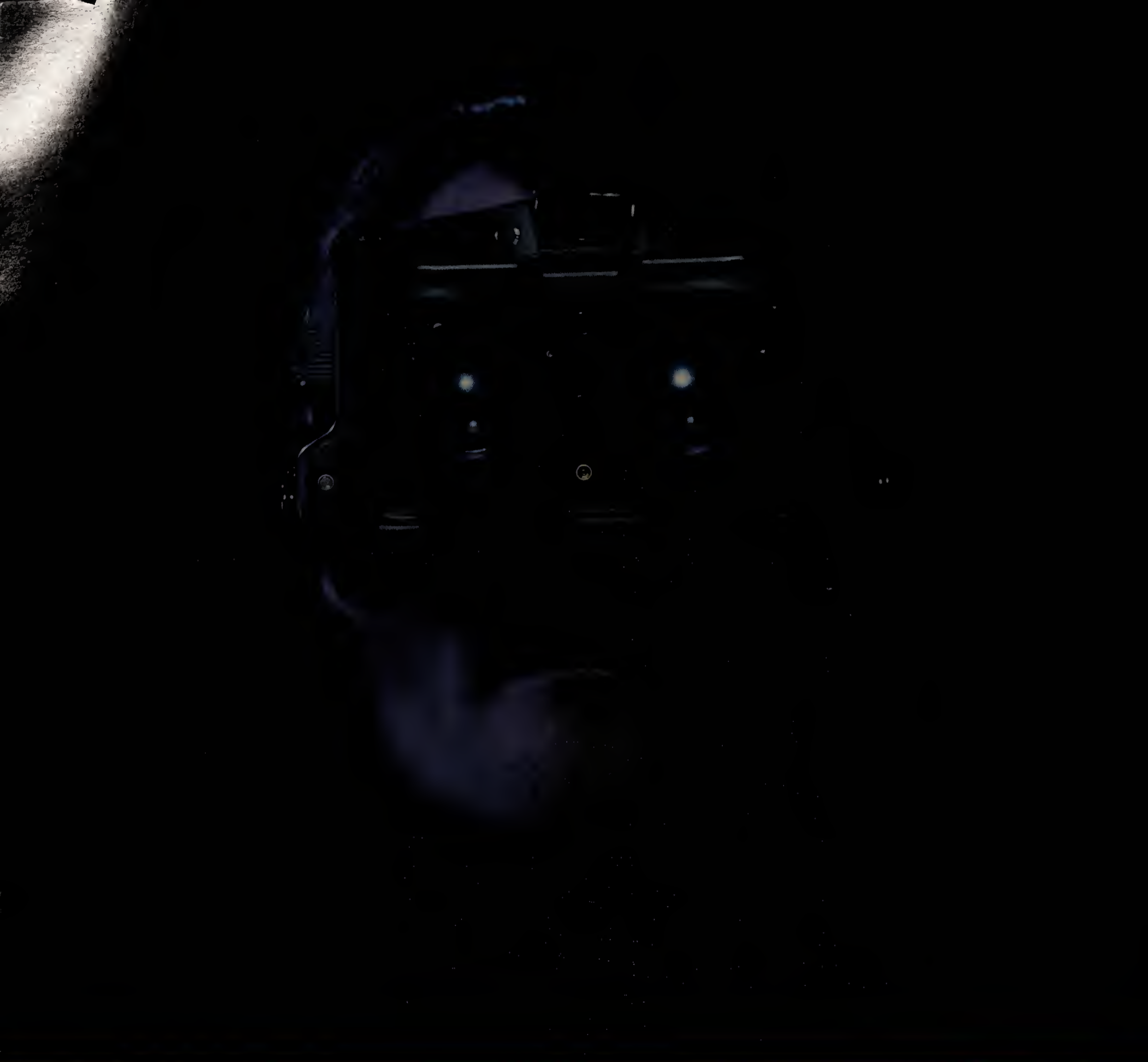
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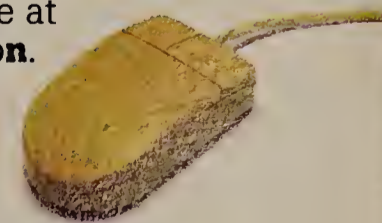
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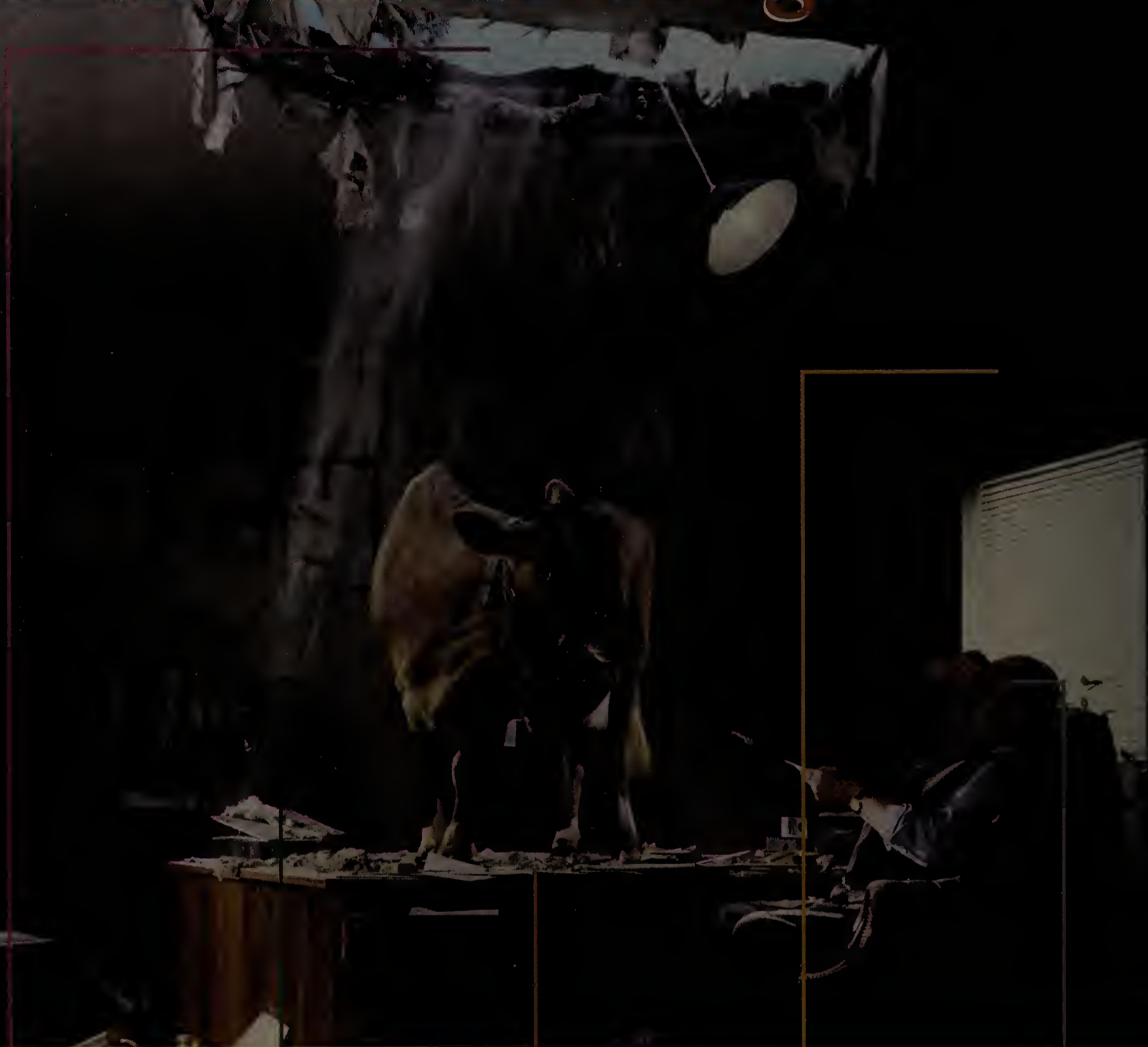
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THIS WEEK ONLINE



Keeping Current. The newest campaign slogan for the GOP? "We're our own ISP." The Republican

National Committee has launched GOPnet.com, an ISP geared toward Republicans. But Fred McClimans questions whether the business-savvy Republicans can make money on the Internet. Will they offer a "liberal content" filter? And how soon will the Democrats follow suit? **DocFinder: 5551**

Twice the advice. In conjunction with our Best Issue, we've got the career experts online all week waiting to answer your tough job queries. Want to know how to ask for a raise? Looking to expand your skills? Ask Career Doctor Shaun Kelly and Career Advisor Tom Whitley for their recommendations in our forum. **DocFinder: 5540**

In the Works. What's happening inside one of the nation's largest research labs? Find out in this week's "In the Works," our new series on the future of technology. Tim Kuhfuss and Rick Stevens take you behind the scenes at Argonne National Laboratory to show you what's on tap. Find out what hot projects could have an impact on your network. **DocFinder: 5549**

Break 'em up? Water coolers everywhere are buzzing with talk of the possible breakup of Microsoft. But how would you benefit from such a move? Read our Face-off on page 18 and then head online. We've got industry experts Hillard Sterling and Edward Black online all week to hash out the ramifications with you. **DocFinder: 5547**

A real knee-slapper. You've all been party to bad network jokes. But how about the good ones? We've gathered the best of the Internet for you. Head online and let us know what you think. Make sure you add your own. **DocFinder: 5544**

Network trivia. Who invented Ethernet? OK, that's too easy. But do you know who invented Ethernet switching? How about e-mail? Test your network knowledge in our online quiz. If you get all the answers right, you could be eligible to win the grand prize. **DocFinder: 5542**

NetworkWorld

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THE BEST ISSUE

Cover illustration by Terry Allen

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- Great network projects: The 1999 Network World User Excellence Award winner and runners-up.
- Top management strategies for network executives.

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News

New protocol sneaks IPv6 traffic over the 'Net

BY CAROLYN
DUFFY MARSAN

WASHINGTON, D.C. — In its battle to get IPv6 widely deployed, the Internet engineering community is pursuing an infiltration strategy reminiscent of the Trojan War.

The Internet Engineering Task Force (IETF) is developing a protocol — called 6to4 — that hides IPv6 packets inside IPv4 packets, allowing IPv6 traffic to run over an IPv4 backbone. The new protocol is aimed at working around one of the biggest stumbling blocks to the deployment of IPv6: the ISP industry's lack of interest in migrating the core of the Internet to IPv6, an enhanced version of IP. The 6to4 protocol lets network executives migrate to IPv6 whenever they want, regardless of whether their ISPs support IPv6.

The 6to4 protocol is the latest in a series of tools being

developed by the IETF to aid in the transition of the 'Net from IPv4 to IPv6. Based on 30-year-old technology, IPv4 is causing an Internet address shortage because it assigns 32-bit addresses.

IPv6 solves this problem by using 128-bit addresses, therefore supporting a virtually limitless supply of Internet addresses. While the 'Net address shortage is not so severe in the U.S., Internet addresses are hard to get overseas.

The main criticism of IPv6 is that it requires a difficult and time-consuming migration from IPv4. Network professionals have to reconfigure every device with 'Net access to support IPv6. Originally, the IETF thought ISPs would want to

move to IPv6 to meet customer demand for new Internet addresses. However, ISPs have so widely deployed network address translation (NAT) devices, which coordinate multiple intranet addresses through a single

Internet address, that they're in no hurry to move to IPv6.

The IETF's latest thinking is that corporate networks at the edge of the Internet will migrate to IPv6 first, when they start running into address shortages. Network

executives also may move to IPv6 because of configuration problems and the high costs associated with NAT devices.

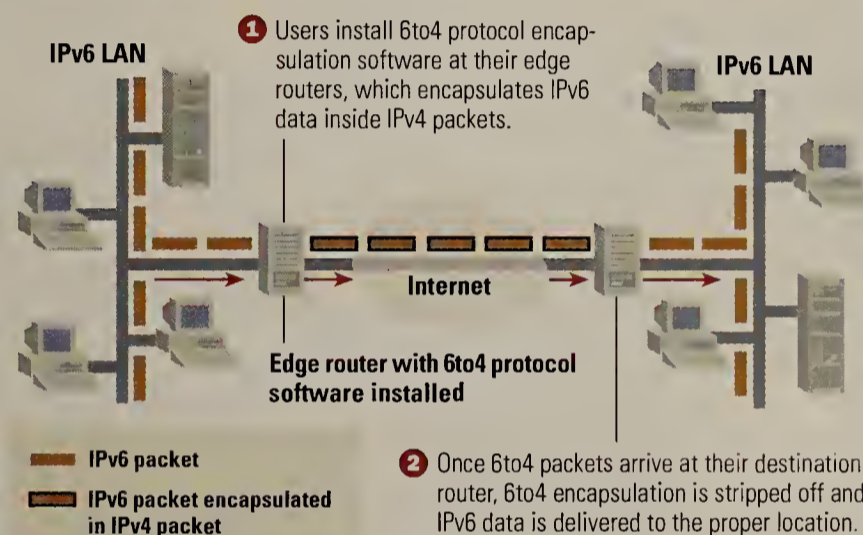
At the IETF's 46th meeting held here last week, the 6to4 protocol garnered much attention as one solution to the chicken-and-egg problem of IPv6 migration. Part of the reason for 6to4's high profile is that its authors are two IETF heavyweights: Brian Carpenter, head of the Internet Architecture Board, and Applications Area Director Keith Moore.

"6to4 is the single most important thing on our plate," says Bob Fink, co-chair of the IETF's Next Generation Transition Working Group and an engineer with the Department of Energy. "In terms of what's hot at this meeting, 6to4 is almost ready to boil over."

"There's a lot of support for 6to4," says co-author Moore. See **IPv6**, page 151

Getting a jump on IPv6

The 6to4 protocol lets users on IPv6 networks communicate over IPv4 backbones with minimal configuration changes.



ASPs come in a variety of shapes and sizes

BY DENISE
PAPPALARDO

Sifting through myriad ASP offerings is leaving business users bewildered.

While it's easy to find application service providers that offer the exact same customer relationship management (CRM) or enterprise resource planning (ERP) application, it's not at all easy to decipher the differences between each ASP's service offerings.

The confusion is understandable. There are ASPs that:

- Let users retain ownership of their applications and those that don't.
- Team only with a single network service provider.
- Specifically target one industry segment or another.
- Make their application rental services available only through a Web site.

Business users clearly need a better understanding of what will and will not be



Second in a four-part series.

included in any given ASP offering. However, because this is a relatively new market, ASPs themselves are still trying to define what they do, says Greg Runyan, analyst at The Yankee Group, a consulting firm in Boston. "There will be a certain degree of clarity emerging over time with ASPs becoming more focused, but there still is a lot of confusion," he says.

ASPs such as USinternetworking (USi), Qwest

Cyber.Solutions (QCS), and Sprint and Deloitte Consulting's joint ASP initiative are trying to attract the largest base of business users. All are offering high-end ERP and CRM application hosting services and are not limiting their service offerings to the small and midsize businesses that until recently have been considered most likely to go the ASP route.

Analysts say these heavyweight ASPs may be able to offer systems integration and customization features that their smaller brethren simply don't have in place.

But while these three ASPs are going after similar business users, there are still some differences in their approaches. For instance, USi retains ownership of the applications it offers business users. USi hosts Siebel Systems, PeopleSoft, Broadvision and Microsoft

Office 2000. Users who subscribe to USi's application hosting services are, in a sense, buying a subscription license that's paid each month along with their monthly application and server management and monitoring fees. USi is also one of

the few ASPs that has built and owns its own data center.

QCS is also offering its customers high-end applications such as SAP's CRM suite. But the choice of application ownership is up to its customers.

QCS lets its customers either come in with an existing SAP, PeopleSoft or Siebel license; buy a new license outright; or have the application subscription licensing fees included in their monthly bills. The third option will leave application ownership with the ASP. Sprint and Deloitte Consulting's recently announced partnership offers business users the same choices.

For some users, it may not matter who owns the application, because in all cases, the user owns the content. But users need to ask themselves how long they plan on staying with their ASPs. If a user signs

See **ASP**, page 152

The Upshot

Not all ASPs are created equal, so choosing one can be complicated. Prospective ASP customers should ask about issues such as who will retain ownership of the applications and which network service providers the ASP works with.

NEWS BRIEFS, NOVEMBER 15, 1999

CA execs will fight to keep \$550M

Computer Associates says it will fight a decision by a Delaware judge that calls for three of the software company's top executives to pay back the \$550 million they received in executive compensation. The ruling came last week in response to a lawsuit filed last year against the firm's board of directors by shareholders, alleging that the compensation was excessive.



CA's Charles Wang ...

The executives who received the disputed package are Charles Wang, chairman and CEO; Sanjay Kumar, president and chief operating officer; and Russell Artzt, company co-founder and executive vice president of research and development. The compensation was intended as a reward for a \$17.4 billion increase in CA's financial performance, according to CA.

Look for 3Com deal with F5

3Com is expected to announce a partnership with F5 Networks to add server load-balancing capabilities to 3Com switches. F5 is the server load-balancing supplier of choice, having hammered out OEM resale arrangements with Cabletron and Extreme Networks. 3Com officials say they will make an announcement regarding server load balancing for their CoreBuilder LAN switches before the year-end but declined comment when asked if F5 is the source of the technology. An F5 spokeswoman says her company has no knowledge of an impending relationship with 3Com.

Cisco takes new stab at switch

Cisco is looking to regain credibility in the ATM WAN switching market. The company is developing a 180G bit/sec version of its MGX 8800 switch, according to Executive Vice President Don Listwin. Cisco took it on the chin earlier this year when it was revealed that the company quietly killed off the TGX 8750, a 20G bit/sec ATM core WAN switch announced with much fanfare in June 1998. The 180G bit/sec MGX-3 and the 45G bit/sec MGX-2 are both in a single-site trial with an undisclosed customer, Listwin told analysts last week. The MGX-2 will be at multiple customer sites next month.

FCC to rule on line sharing

The Federal Communications Commission this week will rule on a proposal that could mean lower prices and faster provisioning times for digital subscriber line (DSL) services. Called line sharing, the proposal would let competitive carriers sell DSL services on a phone line at the same time that the regular local phone company is selling voice service on that line. Competitive carriers say line sharing will save them the cost of leasing a separate line. Because the lines will already be in place, it should also cut the delivery time on a DSL service order.

\$100M buys a lot of beans

BEA Systems says it will buy The Theory Center, a Boston software company that specializes in building reusable Java components called Enterprise JavaBeans (EJB). The Theory Center has more than 80 of these components, all aimed at electronic commerce applications. Because EJBs use standard interfaces, they can be combined with other third-party EJBs to quickly build applications. The acquisition fits nicely with BEA's EJB processing product, the BEA WebLogic application server. BEA will pay about \$100 million in stock and cash for The Theory Center, which has 42 employees.

Nothing funny about 'FunLove'

This isn't the kind of lovin' overworked managers need. Last week, researchers uncovered a virus dubbed "FunLove" that can open holes in Windows NT file security. FunLove, 4099, rated a moderate risk, adds a file to the system folder called flcss.exe that attaches itself to files with .exe, .scr or .ocx extensions.



If those files are opened on an NT administrator's PC, the virus alters the security setting, giving anyone who uses that machine full access to all files. A company in France reported an infection that spread to its computers in the U.S.

Airlines fly in Web formation

Four major airlines last week said over the next six months they will together launch a travel site that will compete with Web sites Travelocity.com and Expedia.com. United, Delta, Northwest and Continental — which account for 55% of the domestic airline market — say their site will offer airline, hotel and car rental services.

IP enhancements coming to UnixWare

BY MARC SONGINI

SANTA CRUZ, CALIF. — Users of Santa Cruz Operations' UnixWare are due to get major network performance, scalability and security boosts in the server operating system's next release.

The improvements in SCO's Jupiter release of UnixWare will center on a revamped IP stack, which handles the task of communicating between the operating system and IP networks. SCO says the stack will enable UnixWare servers to maximize bandwidth usage and minimize CPU exploitation.

adding three servers per week to his enterprise network and wants each of them to support the heaviest application workload possible.

Medlock adds that the IPSec support will make implementing security across his network easier and less expensive. Currently, he has to use features in his firewalls and routers or separate security products to support VPNs.

The IP enhancements should enable UnixWare to better compete against more scalable products, such as Solaris and HP-UX, and fend off challenges from Linux, observers say.

SCO's operation cruises along

Between OpenServer and UnixWare, SCO shipped the most copies of Unix for servers last year.

1998 worldwide Unix server operating systems shipments:



Overall, the upgraded stack will translate into a threefold performance boost for the operating system, says Jon Coyle, an SCO product manager. This means servers running the Jupiter edition of UnixWare, due out in about a year, will be able to support more end users and handle a heavier application processing workload.

Other improvements to the IP stack will include support for network address translation, IP Security and new management features.

The enhancements come as welcome news to Scott Medlock, chief operating officer of Commercial Open Systems, a Kansas City, Mo., network engineering company with 25,000 users on its network of 64 UnixWare servers.

"Right now, our limitation is the stack," Medlock says. He's

SCO's planned UnixWare upgrades include:

- Support for network address translation, which means firms can use one external IP address to serve a number of internal network addresses that are invisible to the outside. Companies can save money and simplify management by using fewer IP addresses.

- Support for IPSec for encryption and host authentication. Currently, UnixWare has no native virtual private network tools. In the future, SCO may also incorporate other security protocols, such as Layer 2 Tunneling Protocol and Point-to-Point Tunneling Protocol.

- Better subsystem monitoring tools that can be used to record events on UnixWare machines, such as hacker attempts on a Web server. ■

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Novell to push NDS as Internet directory linchpin

BY DENI CONNOR

LAS VEGAS — Novell this week will use the Comdex trade show stage to tout Novell Directory Services (NDS) as an Internet directory of user names and purchasing information for electronic commerce companies. The move is drawing mixed reviews from industry analysts and customers.

As part of the strategy, Novell says its newest version of the directory, NDS Version 8, will be available separate from the NetWare network operating system. NDS is for use by companies looking to build customer and partner relationships, as well as to integrate their supply chain functions. New versions of NDS for Solaris and Linux will also be available. Previously, NDS was only available for Windows NT and OS/390.

Using Directory Services Markup Language (DSML) and Extensible Markup Language (XML), Novell will create connectors between NDS and users' supply chain or customer databases. This capability will

let online business be conducted more easily and predictably, Novell contends.

Novell CEO Eric Schmidt will describe the firm's e-directory initiative in his Comdex keynote address. Cisco, Nortel and Lucent, among others, have agreed to develop directory-enabled quality-of-service applications and directory-enabled products and software around the Novell initiative, which is being called e-coPartners and e-coIntegrators. Novell will also announce three participants in the .com market that will use NDS as their e-commerce directory of choice, according to a Novell source.

Greg Weiss, an analyst for D. H. Brown in Port Chester, N.Y., says he is skeptical that Novell will succeed in this e-commerce foray. Weiss contends that Web site developers are more likely to use databases

than directories to store user lists and logon information.

"Novell needs to target its marketing around why its [directory] approach is better than databases for stuffing names and passwords," Weiss says. "The company has to make it easier for a Web developer to use NDS as a user-authentication database than some home-grown database he or she develops, and Novell needs to help Web site developers correlate information into NDS."

One customer expressed more optimism. Chuck Yoch, chief network architect at Janus, a mutual fund company in Denver, sees the directory as a perfect repository for data and authentication information.

"Our market is going to get a whole lot more interesting when we find all that we can do with directory-enabled networks and the services they can provide for us," he says. "We're looking at DirXML [Novell's directory synchronization tool] and DSML right now to see

what they can do for us."

Samm DiStasio, a Novell product manager, says that because NDS is able to authenticate users securely within a network, it is a natural for e-commerce policy and user management in companies that want to capture and store customer relationship information.

Also as part of Comdex, Gadzoox, a Novell partner, will demonstrate a Fibre Channel hub that the company claims is the first NDS-managed hub. Other vendors, such as business-process company Oblix, will also make announcements with Novell. Oblix will use NDS as a repository for information gathered by its eProvision Employee software, which uses the directory as a common source for company information on a person.

Laura Didio, an analyst with Giga Information, says Novell has a good opportunity to recast itself as a Web directory services provider. "Despite the company's best efforts to sink itself because of bad marketing, the repeated delays of Windows 2000 and the churn in the e-commerce market are allowing customers to give Novell a second look," she says. ■



Schmidt is depending on lots of third-party help to make NDS the e-comm directory of choice.

Novell's e-coPartners and e-coIntegrators

A number of company's have signed on with Novell to support the company's e-comm enabled directory.

- Cisco Systems
- Nortel Networks
- Lucent Technologies and Lucent
- NetObjects
- Oblix
- ObjectSpace
- enCommerce
- BulletProof
- Dell
- Oracle
- Compaq
- Hewlett-Packard
- Sun
- Lotus
- Computer Associates
- Bowstreet
- Microsoft
- AT&T
- IBM
- Isocor
- Check Point
- Netegrity
- intracis
- Evergreen
- Unimax
- Globalcast

More breaking news

Network World Fusion now has more news than ever. Check out these stories online:

IETF meeting: Wiretap debate full of static

In a surprising turn of events, the Internet engineering community last week sent a mixed message to its leadership regarding the development of protocols that would make it easier for law enforcement agencies to intercept communications over the 'Net.

DocFinder: 5552

AT&T launches new contract bundle

The company this week launched AT&T Business Network, a package of bundled voice and data services and electronic-servicing features.

DocFinder: 5553

Cabletron grows switch family

Targeting small to large enterprise networks, Cabletron this week added two new members to its MultiSwitch line of LAN switches. The MultiSwitch FE Switch 924TXG and MultiSwitch FE Switch 916TXG deliver 24 and 16 ports of 10/100 Fast Ethernet and modular Gigabit Ethernet ports to provide high-density Layer 2 switching.

DocFinder: 5554

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DocFinder: 3850

HP speaks up about new e-commerce

E-speak technology set to support next breed of personalized data services.

BY ELLEN MESSMER

SAN JOSE — Hewlett-Packard last week gave the world its first glimpse at e-speak — an ambitious software technology that the firm hopes will thrust the company into the middle of many customers' electronic commerce plans.

While the technology is complex, it boils down to this: It will enable the development of personalized data services targeted at individuals or groups of e-speak subscribers, and it will be accessible via the Web or wireless handheld devices. Many types of companies will be able to generate content and act as service providers, although ISPs will be the most likely service delivery candidates.

HP showed off the technology, which will be released Dec. 8, to representatives from about 200 companies attending the firm's first e-speak developer's conference in San Jose.

E-speak consists of Java-based "broker" technology that HP will license to service providers, as well as XML-based technology that will be free to companies generating content for e-speak-enabled services. Content providers can use this freeware to make content available securely to any service provider that wants to deliver it. Content could include things such as store locations and stock updates.

E-speak has grabbed the attention of several overseas

firms. Helsinki Telecom has signed on as the first taker of the e-speak broker software. HP, Ericsson and Swedish ISP Telia also intend to test e-speak services next year for use with phones incorporating Wireless Application Protocol technology.

"We will deliver taxi and restaurant information, for example," says George Demrtzoglou, GSM business developer at Ericsson's cellular division. "There are many possibilities."

Sami Jormalainen, who works for Finnish wireless systems integrator LPG, says his firm is organizing an e-speak services portal in the U.S. for an ISP whose name he would not disclose. ■



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'Bubbleboy' e-mail virus benign, but also a warning

BY JOHN FONTANA

The recently discovered "Bubbleboy" e-mail virus probably won't be causing any headaches for IT executives, but they better ready their defenses for his offspring.

Bubbleboy variants will have the ability to spread faster than the

"I assure you that in about six months you will see someone try to exploit the design of this virus."

Dan Schrader, vice president of new technology, Trend Micro

Melissa virus, which ate up corporate e-mail systems earlier this year. The most frightening aspect of the new worm, researchers say, is that users do not have to open an attachment to activate it, which was the trigger for Melissa.

The worm affects Microsoft's Outlook and Outlook Express e-mail clients when used with Internet Explorer 5.0 on Windows 98 and 2000. Windows 95 with Windows Scripting Host installed also is vulnerable.

Bubbleboy, named after an episode of the TV show "Seinfeld," was mailed to various virus researchers last week. While the virus is mostly benign and not active on the Internet, researchers are warning IT executives to brace for spinoffs.

"This is a proof-of-concept virus," says Dan Schrader, vice president of new technology for antivirus vendor Trend Micro.

Schrader says his company

received a copy of the virus from an anonymous source on Nov. 8. "I assure you, however, that in about six months you will see someone try to exploit the design of this virus."

The worm, which is a type of virus that makes copies of itself from computer to computer, is sent via e-mail with the subject line, "Bubbleboy is back!"

IT executives should not panic, Schrader says, because a patch already exists for Bubbleboy, which is exploited through a previously discovered hole in Microsoft's Active X controls.

In Outlook Express, Bubbleboy can activate if the e-mail is viewed through its "preview pane," and in Outlook if an e-mail is opened.

Once a machine infected with Bubbleboy is restarted, the worm changes the name of the registered owner of the software to Bubbleboy and the registered organization to Vandelay Industries, a fictitious com-

pany that comes from yet another "Seinfeld" episode.

The worm then sends the Bubbleboy e-mail to every entry in Outlook's address book.

Microsoft released a patch in August (<http://www.microsoft.com/security/bulletins/ms99-032.asp>) and IT executives are advised to download and install it.

The worm will also not propagate if Internet security settings on Internet Explorer 5.0 have been set to "High."

"This is clearly a case where diligence pays off [in keeping virus software updated]," says Fred Rica, a partner in PricewaterhouseCooper's Technology Risk Services Group. ■

Messaging

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Vendors up load-balancing ante

Foundry focuses on boosting switch speed, Alteon looks to improve traffic prioritization.

BY JEFF CARUSO

Server load-balancing technology is rapidly advancing, as vendors soup up their products with higher speeds and broader functions.

Foundry Networks this week will unveil a faster version of its server switch and will give its high-end switching router chassis load-balancing capabilities through a software upgrade. The news comes on the heels of Alteon WebSystems' introduction of technology that will enable users to balance network traffic loads based on software cookies.

A load-balancing switch sits in front of a server farm, intercepting net requests and re-directing them to other servers with similar content. Large vol-

umes of requests can be handled this way. If a server fails, the workload is simply spread to the other servers in the group.

Server load-balancing technology is starting to mature enough to be trusted, says Marc Felton, a network engineer at Xoom.Com, an electronic commerce firm. But the key is to keep it simple, says Felton, who likes Foundry's server switch because its command-line interface makes the device easy to configure.

"Server load balancing should not be all that difficult," he says.

In response, Foundry has decided to keep its load-balancing capabilities based in software, until the pace of change slows. While putting the functions in hardware would speed things up, it would also make it difficult or

impossible to add new functions to existing gear. Foundry plans to include load balancing in chips in the second half of next year, in a project code-named Velocity.

The switch the firm will release this week has a 400-MHz PowerPC CPU, an upgrade from the original 240-MHz version. Called the ServerIronXL, it doubles performance to 500,000 packet/sec. All the ServerIronXL's functions can now be loaded into Foundry's BigIron chassis via a software upgrade and a new management module.

The ServerIronXL starts at \$8,000 for an eight-port 10/100M bit/sec version. The software upgrade for the BigIron costs \$15,000, and the new management module costs \$27,000. All of these products

are shipping now.

Meanwhile, Alteon's switches are getting a software upgrade to perform what the company calls cookie load balancing. A cookie is a bit of information, conveyed by a Web client to a site, that can be used to convey a user's identity. Using that information, Alteon's server switch can send requests with different cookie settings to different servers connected to the switch. One use might be to give some users a higher priority than others and send the high-priority requests to a faster or less-encumbered server.

The new technology is shipping now as a free upgrade to Alteon's switch software.

Alteon: www.alteon.com;
Foundry: www.foundrynetworks.com

Lucent turns to mirrors for optical switching

BY TIM GREENE

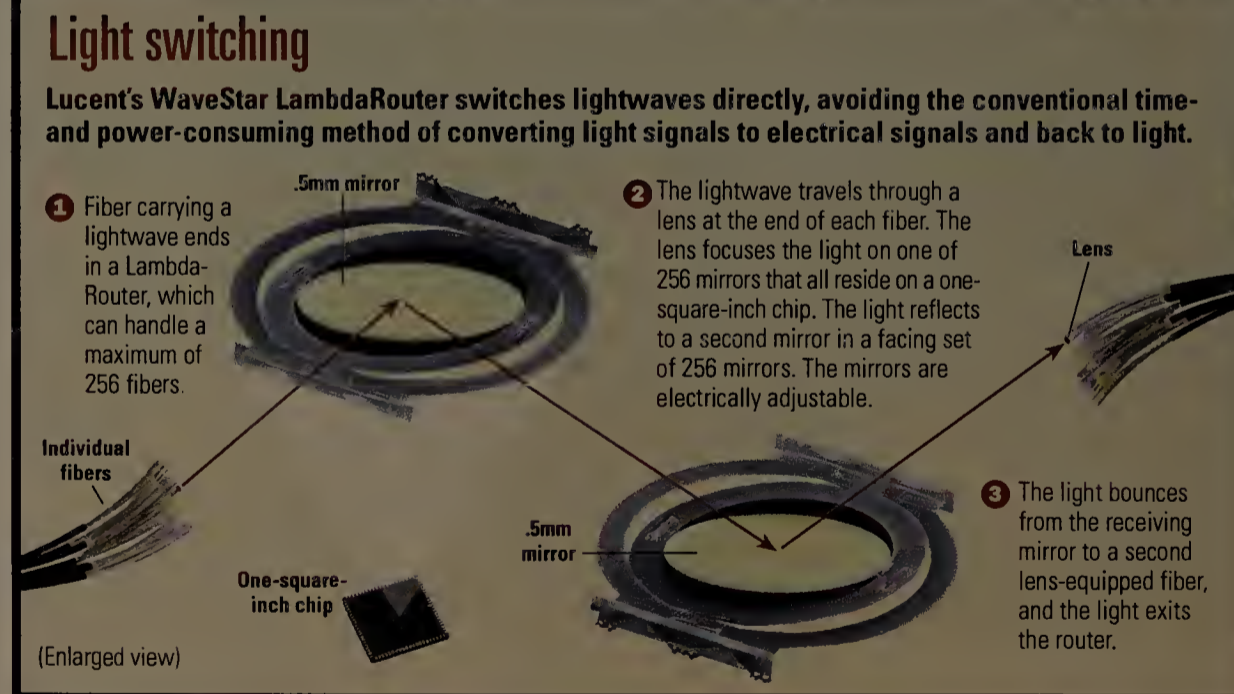
MURRAY HILL, N.J. — Lucent has taken the electricity out of switched optical networks.

The company next year plans to ship the WaveStar LambdaRouter, an all-optical device that switches light from one fiber to another without first converting the light to an electrical signal and then back to an optical one.

It is this electrical detour that slows traffic on today's fiber-optic networks. While the new Lucent gear is aimed squarely at service providers, enterprise networks could be the ultimate beneficiaries if carriers are able to offer higher-speed services more widely.

A single LambdaRouter can switch up to 40 gigabits of traffic, the capacity of 256 separate optical fibers, each carrying a single wavelength. With wave-division multiplexing, each fiber can carry more than one wavelength, increasing the potential capacity of the device.

While calling the device breakthrough technology, one analyst says the LambdaRouter



still has to prove itself. The key questions Lucent has yet to answer are whether the devices will scale as large as carriers will need and whether they will be inexpensive enough to make them worthwhile, according to Dana Cooperson, a senior analyst with RHK, a consulting firm in San Francisco.

Lucent claims the LambdaRouter will cut carrier operat-

ing expenses by 25%.

Despite its name, the device is not actually a router. It is more akin to a cross-connect, a static switch in conventional telephone networks. Each LambdaRouter can take 256 fibers in and put 256 fibers out. The traffic is carried on waves of light that are switched through the LambdaRouter using two banks of adjustable, circular mirrors that are each a half millimeter in

diameter (see graphic).

Lucent claims a series of LambdaRouters can be configured easily by a carrier to quickly provision light paths across a network.

Select carriers will get LambdaRouters to test in July, and the boxes will ship in December 2000. Lucent would not say how much the boxes will cost.

Lucent: www.lucent.com

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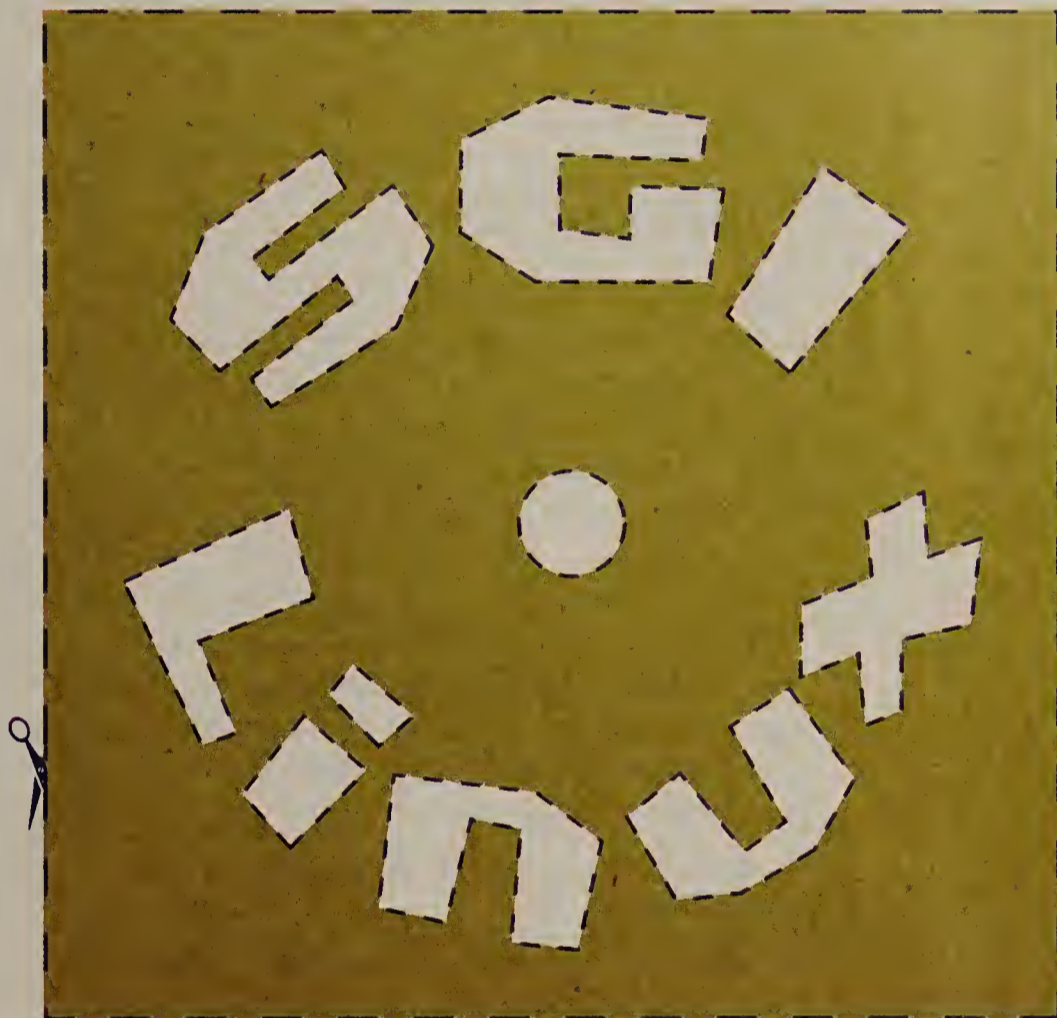
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Industry not keen on government regulation

Observers say possible Microsoft penalties could bring unwanted scrutiny — or damage the industry.

BY JOHN FONTANA

Love or hate Microsoft, one consistent theme is emerging as speculation runs rampant about possible penalties in its antitrust suit: Intrusive government regulation of the computer industry is not welcome.

From Microsoft's most dedicated detractors to those who don't think any penalties are needed, many industry associations, analysts and end users say heavy-handed government regulation of Microsoft as part of any possible penalty would set a bad precedent in the industry.

"I loathe Microsoft, but government intervention is permanent," says Eric Raymond, president of the Open Source Initiative, a Linux support association. "I would rather deal with Microsoft [as it is] than live with government meddling in the industry."

"There is a fear that once the government gets into the industry, they will destroy it," says Rob Enderle, an analyst with Giga Information Group in Santa Clara.

"There is an increasing concern that there will be more lawyers than program-

mers in this industry," says Jonathan Zuck, president of the Association of Competitive Technology, a Washington, D.C., group that

opposes government regulation. "The government's findings represent a clear signal that it is pursuing a course of regulatory intervention into

the IT industry."

Zuck says Microsoft's competitors are partly to blame and should have been careful about what they wished for.

"Microsoft's competitors have been doing a rain dance for three years. Now after feeling a few drops of rain, they realize they don't have an umbrella

Heard online

We created a forum for our readers to hash out Judge Thomas Penfield Jackson's initial findings on the Department of Justice vs. Microsoft case. Here's a sampling of what they had to say:

For Judge Jackson's findings:

"No one ever got fired for buying Microsoft products, but no one ever got promoted for it either. It's always been the 'safe' option. Now [it may not even be] a good option."

Jeremy Fry, technical consultant, Barron McCann

"There was an old joke about AT&T before the breakup: 'Without us — you ain't got no phone!' — and they were right. But now there are many alternatives and very cheap rates with great services."

David Poole, corporate network administrator, AGRA Earth & Environmental

Against Judge Jackson's findings:

"Scott McNealy, Larry Ellison, etc . . . all want what Microsoft has . . . Unfortunately they don't want to compete head-to-head with Microsoft so they decided to use the federal government to do it for them."

Brad Skeel, senior consultant, Magenic Technologies

"If someone would make a product that COULD compete with Microsoft there would be competition. Look at Linux — Microsoft hasn't been able to stop its momentum because it's a good product."

Jeff Porn, system consultant, Wausau Financial Systems

Add your thoughts to the forum. DocFinder: 5440



Judge Thomas Penfield Jackson

Justice Department vs. Microsoft: It's not over yet

Following the Nov. 5 release of the findings of fact in the government's antitrust suit against Microsoft, U.S. District Court Judge Thomas Penfield Jackson set a schedule for both parties to respond:



Bill Gates

May 18

The Justice Department and 20 states file an antitrust lawsuit against Microsoft. (South Carolina later drops out.)

Sept. 12

Closing arguments.

Nov. 5

Jackson issues findings of fact that brand Microsoft as a monopoly in the operating system market and concludes the company stifled innovation and competition.

Jan. 17

Microsoft will file its own conclusions of law, arguing that Jackson's findings of fact do not lead to Sherman Antitrust Act violations. Neither Microsoft nor the Justice Department, by order of Jackson, can suggest any possible penalties.

Jan. 24

The Justice Department will submit its response to Microsoft's conclusions of law.

Jan. 31

Microsoft will, in turn, reply to the Justice Department's response.

Oct. 19
Trial opens

Dec. 6

The Justice Department must file to Jackson its arguments on particular "conclusions of law," which are details on what laws, if any, Microsoft violated. The Justice Department will detail how it believes Microsoft violated Sections 1 and 2 of the Sherman Antitrust Act.

Sometime after Jan. 31

Jackson will issue his own conclusions of law. His remedies in the case will likely be filed at a later date given the fact that he has precluded both parties from discussing remedies during the conclusions of law phase. The case, however, could be appealed by one or both parties sometime during the process.

Feb. 17

Windows 2000 scheduled to ship.



Bill Neukom,
Microsoft's corporate attorney



DOJ VS. MICROSOFT COVERAGE

and they are saying, 'Oh, no.'"

Government regulation of any penalties Microsoft may receive seems probable because the company has flouted court-imposed mandates before. In 1994, Microsoft was ordered to unbundle Windows 95 and Internet Explorer. Left to its own interpretation of the order, Microsoft gave hardware OEMs the choice of installing an old or inferior version of Windows. The government finally forced Microsoft to offer the products separately. Microsoft eventually won the right to bundle the two products in Windows 98.

The issue took nearly four years to resolve, an eternity in the computer industry.

But that doesn't mean observers think Microsoft should avoid penalty for behavior detailed in the findings of fact handed down by U.S. District Court Judge Thomas Penfield Jackson. Those findings say Microsoft has a monopoly in the operating system market and that the company used its power to stifle competition and innovation. It will be at least another two months until Jackson determines if Microsoft actually broke any laws.

Industry sentiment, however, is that if punishment is warranted it should be done with careful consideration. The concern is not for Microsoft; it is for the industry in general.

"Having the government decide what can go in an operating system is not in anyone's best interest," says Ken Wasch, president of the Software and Information Industry Association, a 1,400-member group that advocates antitrust law and represents software companies and content providers. "It is possible to have conduct remedies that prevent Microsoft from leveraging the operating system, but someone has to monitor and enforce that, and it is difficult to do."

Wasch thinks the solution should be self-executing so enforcement of any penalties doesn't turn into a form of regulation that would slow the "rapid pace of technical change in the software industry."

If there is a remedy regulating Microsoft's bundling of technology with the operating system, the result would definitely restrict Microsoft from leveraging its power in the operating system market. The judicial process for approving any bundling request could be painfully slow. A simple innovation akin to bundling a TCP/IP stack with an operating system could take years to approve.

"The most effective approach is for the court to adopt a remedy that creates a new relationship between the dominant OS provider and the rest of the industry, while eliminating the need for the government to remain as a watchdog of software business practices," Wasch says.

Government regulation in the his-

toric breakup of AT&T became so problematic that it eventually had to be corrected with the Telecommunications Act of 1996.

"IT doesn't want to see Microsoft [become] harder to deal with and less responsive because of heavy government regulation," says Giga Group's

Enderle. "IT doesn't like lots of changes, they like a high degree of stability. The concern is if the government can touch the plumbing they make it worse, not better."

Others are beginning to look beyond the most immediate effects on Microsoft.

"Reality is now hitting the industry as it looks at the harshness of Jackson's findings," says Dwight Davis, an analyst with Summit Strategies in Kirkland, Wash. "They're realizing that if eventually there is government scrutiny, it may not be good for the industry as a whole in the long term." ▣

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FACE-OFF

Should Microsoft be split up?

YES

BY EDWARD BLACK

For the good of the economy, the market, consumers and even for itself and its shareholders, Microsoft should be broken up.

In his findings of fact, U.S. District Judge Thomas Penfield Jackson lays out a monopolization offense of extraordinary strength and breadth. He finds very clearly that Microsoft's actions are part of a persistent course of corporate conduct with no purpose other than to crush competition and stifle innovation.

Now the judge must devise a remedy that will pry open the market, terminate the monopoly and prevent it from reforming. This requires splitting up Microsoft. Otherwise, the company will likely find new ways to continue its anticompetitive practices.



Microsoft has the means to ignore or frustrate less-drastic penalties, such as fines or conduct restrictions, and in the past has demonstrated the willingness to do so. Such penalties would require the government to be involved in day-to-day activities of the industry for years in order to try to ensure that Microsoft behaved and complied with a court order.

Splitting up Microsoft, on the other hand, would allow for the most immediate restoration of competition and would keep the government out of specific business decisions in the market. Dividing the company into competitive entities would let Microsoft focus on making software and innovating without long-term government intrusion.

Look at what happened after the breakup of the Bell system in the early 1980s. It spawned a huge new era of telecommunications and many competitive companies, which in turn unleashed tremendous innovation and resulted in increased efficiency, more jobs and greater wealth. An AT&T stockholder with 100 shares before the divestiture would have turned \$6,000 then into more than \$70,000 today.

Microsoft argues that technology changes make this case irrelevant. But it is precisely the dynamic nature of many sectors of the industry that makes this case so important. Microsoft's monopoly power in PC operating systems makes it nearly impossible for the operating system market to self-correct. Furthermore, Judge Jackson has found that Microsoft's monopoly in that market will continue into the foreseeable future. Microsoft has told Wall Street that the PC will remain the dominant computing tool well into the next decade.

Microsoft points out that innovation and competition exist in other sectors of the high-tech market, and that is true. In those sectors, the competition is vigorous and consumers are winning. But those sectors are not where Microsoft's monopoly exists. In the PC operating system market, prices have increased and innovation has been stifled. If you look at all other components of the PC, prices have declined and advances in technology have been prolific.

There are really only three options. One extreme is to do nothing; the other is to apply an injunctive remedy with severe judicial regulation to keep the monopolist in check. The most reasonable and appropriate way to ensure that competition is restored, innovation is unleashed and consumers benefit is to split up Microsoft.

Black is president of the Computers & Communication Industry Association in Washington, D.C. He can be reached at Ed_Black@ccianet.org.

NO

BY HILLARD STERLING

A Microsoft breakup is inappropriate for several reasons. The Department of Justice's claims boil down to the questionable proposition that Microsoft's conduct has harmed consumers. Supporting this proposition are various anecdotes involving alleged attempts by Microsoft to quash competitive threats. Assuming these anecdotes are true — and Microsoft has not forcefully denied them — they are irrelevant under antitrust law unless they have anticompetitive effects.

In his findings, U.S. District Judge Thomas Penfield Jackson argues that, when considered as a whole, these anecdotes prove that Microsoft has stymied innovation in various computer software markets. Theoretical speculation, however, is a poor substitute for real proof of anticompetitive effects. The appellate process will demand more than a bald assertion that a "pattern" of conduct somehow has stopped companies from developing, distributing and selling competitive products.

Also, it is difficult to understand how these anecdotes address the flaws in the Justice Department's central theory: that Microsoft allegedly tied its browser to its operating system in violation of the Sherman Antitrust Act. The Justice Department has not satisfied its burden of showing that integrating the browser and operating system does not create any plausible consumer benefits. Without this showing, the Justice Department's tying claim falls and with it the motivation for bringing this litigation.

Even assuming the Justice Department has established an unlawful pattern of anticompetitive conduct, a Microsoft breakup would be inappropriate and overblown. As a general matter, judges should tailor injunctive relief carefully to address only the wrongs proven in court. A breakup would far transcend the illegalities alleged by the Justice Department: unlawful tying, exclusionary contracts and bullying of competitors. These alleged illegalities can be easily addressed through "conduct" requirements governing Microsoft's behavior.

Unlike the Standard Oil and AT&T antitrust cases, Microsoft has not gained its power through unlawful anticompetitive acquisitions. Also, Microsoft does not have a stranglehold on virtually all legitimate distribution channels. Even under the Justice Department's worldview, Microsoft's operating system is not an "essential facility" or a mechanism without which competitors cannot distribute their products. Many cost-effective alternative distribution channels exist, including the Internet. Consider Microsoft's recent plan to offer its software to electronic commerce service providers via the Internet. Again, Microsoft appears to be a step ahead of both the competition and the Justice Department's increasingly obsolete views of the marketplace.

I'll let economists decide if a Microsoft breakup will benefit or impair related software markets. Suffice it to say that the possible impacts of a breakup are unclear. Also unclear is the courts' ability to monitor and regulate the conduct of the separated entities.

The bottom line is that a Microsoft breakup is not necessary or justifiable. A breakup order will only make Judge Jackson's decision more vulnerable on appeal. Because the facts and law have not moderated his anti-Microsoft disposition, perhaps his interest in avoiding reversal is Microsoft's lone hope for avoiding a breakup.

Sterling is litigation counsel at Gordon & Glickson LLC, an IT law firm in Chicago. He can be reached at HM Sterling@ggtech.com.



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WHAT DO YOU THINK?

Should Microsoft be broken up?
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A Message from the Publisher



I wonder what it must have been like for the felons at Alcatraz. It seems like for all other prisons, ways to circumvent the security system were developed and established. Originally just climbing over a wall or digging a tunnel brought "freedom" to the felon. But being put in a prison on a "rock" in the middle of the San Francisco Bay proved to be a greater deterrent for felons determined to escape—for a while. Eventually, as it is with most criminals, with each security system developed, they find ways to get around it and break in, or in the felons' case, break out.

Networking today is about developing faster and better ways for employees to work with each other as well as with external partners, distributors, customers, telecommuting co-workers and suppliers. Great tools have been developed to this end—robust applications, VPNs, remote access, sophisticated internal networks. As organizations use these tools to store their competitive advantage in bits and bytes and expand their communications, the need to develop the right security strategy is more critical than ever.

Firewalls, which first prevented attacks from outside organizations, are now used against both external and internal "criminals." And, today, organizations are going beyond the firewall to add security to all the communication tools they use. Their security strategies must now be global and must protect not just their network infrastructure but also their applications, Internet, intranet and extranet communications, and content.

One company taking a unique approach to helping organizations manage the security of their infrastructure, applications, communications and content is Check Point Software Technologies. In 1996 Check Point created OPSEC, The Open Platform for Security, to promote a standards-based framework for managing enterprise network security. Check Point then developed certification criteria for integration to ensure that vendors' products are interoperable and can be centrally managed with a single management policy. The OPSEC Alliance now consists of over 200 vendors—including infrastructure, security and application vendors who use the OPSEC architecture to integrate with Check Point's Secure Virtual Network solutions. Read on to learn more about OPSEC and some of the products and services available from members of the OPSEC Alliance.

Evilee Thibeault
President and Publisher of Network World, Inc.

Integrated Internet Security In The Palm Of Your Hand

The challenges of E-business, an increasingly mobile workforce, and the trend toward greater collaboration between corporate partners have created new requirements for secure connectivity solutions. As corporations move to securing their intranets and building extranets for collaboration and confidential data exchange with suppliers, dealers and partners, they need a solution that facilitates the exchange of mission-critical information and the security to ensure the confidentiality of those exchanges. Check Point Software and partners in its OPSEC™ Alliance can provide exactly this solution, match it specifically to customer's needs, AND enable the central policy management of these products on your network.

A Virtual Private Network (VPN) uses the Internet as the transport backbone to establish secure links with business partners, and regional and isolated offices, significantly decreasing the cost of communications. Check Point's Secure Virtual Network (SVN) architecture goes beyond the basics of VPNs and delivers Internet security that offers scalability, manageability, comprehensiveness, high performance and ease of use. In E-business environments, traditional network borders – between remote users, branch offices, corporate headquarters and third-party partner companies, and between intranets, extranets and the Internet—disappear. SVN is the secure, open solution to this new world because it provides security as a layer that extends across networks, systems

(individual clients and systems), applications and users.

The Open Platform for Security (OPSEC) extends the Secure Virtual Network architecture by providing a unique, open platform for integration and interoperability. OPSEC's open, extensible, standards-based framework allows third-party best-of-breed products and services to integrate seamlessly into one comprehensive solution. Only the combination of OPSEC solutions and SVN can provide a vast choice of the best products on the market. Over 200 companies now use OPSEC to integrate tightly with Check Point's Secure Virtual Network architecture. Read further for detailed information on 16 of these solutions, all available today!

Benefits of OPSEC integration

OPSEC effectively extends the Secure Virtual Network because it answers the greatest challenges of multivendor solutions – interoperability and management complexity – and avoids the biggest problems of single vendor suites – lack of integration and limited flexibility. OPSEC integration means:

- Customers can easily, seamlessly and selectively integrate a full spectrum of security and network management applications
- Policy-based management that allows users the ability to centrally manage an enterprise security policy and distribute it across multiple components in a diverse network environment
- OPSEC Certification to ensure the interoperability of Check Point and OPSEC partner solutions

Using best-of-breed solutions means choosing the best products and services on the market and benefiting from the innovations and expertise of the vendors that specialize in the functionality you need. OPSEC gives customers:

- The best choice of integrated security solutions to meet their needs
- The widest range of networking infrastructure and server platforms on which to deploy their solution

- The greatest number of managed service providers to choose from that offer services based on Check Point (SVN) and OPSEC products
- Unparalleled application support that offers security and control of application traffic across the Secure Virtual Network

OPSEC Certification

OPSEC certification provides the assurance that these integrated products have been fully tested for interoperability and integration with the OPSEC platform. This eliminates the burden on customers of having to verify that products from different vendors can work together in an integrated fashion to provide all aspects of enterprise network security.

Look for products that have earned the "OPSEC Certified" or "OPSEC Secured" logo and rest assured that they will integrate seamlessly with Check Point's Secure Virtual Network architecture. See the back cover of this supplement for a list of the OPSEC partners with Certified and Secured solutions.

Integrated Security Now

The OPSEC platform has established the de facto standard for integration; it boasts the broadest operating system and network infrastructure support and its enterprise integration interfaces have been adopted by more third parties than any other security platform in the industry. Using the OPSEC software development kit (SDK) and industry standards, vendors have been developing products over the last two years, delivering complimentary security applications defined and driven by a single, central, enterprise-wide security policy.

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Check Point's OPSEC initiative has facilitated the integration of the world's leading firewall and content security product, FireWall-1® and MIMESweeper. This tightly integrated and managed solution is a powerful combination that provides a complementary set of features to provide comprehensive security for both connections and content of communications, on a platform that can grow in the future.

As part of the OPSEC initiative, MIMESweeper for FireWall-1 is CVP compliant which means existing FireWall-1 customers can deploy MIMESweeper as an approved Check Point content security solution.

Tightly integrated and managed within FireWall-1, MIMESweeper for FireWall-1 is the only content security solution that combines anti-virus controls with other content control functions such as protecting confidential information, blocking offensive language, protecting legal liability, neutralizing Java and ActiveX applets/scripts, archiving email, managing junk email, content rating and blocking of Web pages and sanitizing cookies.

As illustrated in the diagram, MIMESweeper for FireWall-1 scans objects and content of transfers in SMTP e-mail, Web and native FTP transfers. Objects are managed through three key stages.

Disassembly

- identification of the contents of the data-stream
- recognition and management of compression and encoding formats used in internet transfers
- recursive decomposition of objects to identify original content

Validation

- multiple virus scanning of Web, FTP and SMTP e-mail traffic
- keyword search of Web transfers
- stopping banned file types on Web downloads

Disposal

- block or pass through based on validation
- notification using CVP inform messages

MIMESweeper's vendor-independent product architecture also supports the use of multiple virus scanners, which can be employed to maximize detection rates by minimizing the specific weaknesses in each virus scanner product. This is a significant advantage because customers can continue with their preferred choice of virus scanner and yet choose additional products for increased security.

MIMESweeper is priced according to the number of email and Web users on a network. Evaluation copies are available from: www.mimesweeper.com and www.opsec.com.

MIMESweeper for FireWall-1 manages objects through three key stages.



QUICK FACTS

MIMESweeper



OPSEC Integration Benefits

- Enhances the investment in FireWall-1 with OPSEC certification
- Specially designed for and tightly integrated with FireWall-1

Product Benefits

- Carries out key content security functions such as virus scanning, protecting confidential information, blocking offensive language and blocking specified Web pages
- Provides Recursive Decomposition for Virus Scanning CVP compliance



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W W W . O P S E C . C O M

Countering the Lure of Internet Seduction

SPECIAL ADVERTISING SUPPLEMENT



Content Security

Properly managed, the Internet can be an invaluable information resource for your company. Without controls, however, it can reduce employee productivity, lead to litigation, and impair your company's reputation. JSB's surfCONTROL, the market leader in corporate Internet filtering software and a Check Point OPSEC Partner, will monitor and control employee use of the Internet to ensure that Internet access is business access. "The Internet can be a seductive place," says Steve Purdham, president of JSB surfCONTROL, based in Scotts Valley, CA. "When your employees spend work-time surfing personal interests, it digs right in to your firm's bottom line." surfCONTROL gives employers a collection of flexible, easy-to-use tools that help them avoid problems before they become an embarrassment or lead to costly litigation. "We use surfCONTROL to help solve hostile workplace issues," says Jack Atwell, president of Trellis Network Services in Princeton, N.J. "The cost of lost productivity and legal exposure to our customers is huge because you never know who's doing what on the Internet. The unlikeliest people sometimes cause the largest problems," he says.

With the Internet well established as a must-have business tool, it is incumbent upon any company to ensure that the inadvertent or misguided actions of a few people do not negatively impact the performance of the rest. "Increasingly, companies have to worry about employees sending inappropriate E-mails which can then be used to show the employer tolerated a hostile work environment," says Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass. Christiansen commends surfCONTROL because of its positive slant. "I like the fact that it contains both a positive and a negative list of sites. So it doesn't merely stop employees from visiting certain sites, it also encourages them to visit others."

According to IDC, surfCONTROL is the No. 1 vendor in the market. "The rapid growth rate of this market reflects corporations' concern with the seriousness of uncontrolled Internet access," says Christiansen. surfCONTROL seamlessly integrates with Check Point FireWall-1 providing the ability to easily define, manage and enforce an organization's "Acceptable Internet Use Policy." surfCONTROL gives you the tools to understand Internet use, along with rules that allow you to implement your acceptable Internet use policy. "Using the built-in reports, companies can do much more than block access to selective sites," says Atwell. "They can warn the individuals who are breaking the policy or take corrective actions such as counseling and thereby protect the company."

Find out if your organization is suffering from Internet Seduction. Download a FREE 30-day Trial today at www.surfcontrol.com and www.opsec.com.

Find out if your organization is suffering from Internet Seduction



QUICK FACTS

surfCONTROL®

OPSEC Integration Benefits

- Seamless integration with the leading policy enforcement product: FireWall-1
- Integration enables organizations to enforce an "Acceptable Internet Use Policy"
- High-performance web filtering using URL Filtering Protocol

Product Benefits

- Protect employee productivity by eliminating the opportunity for idle exploration
- Conserve network bandwidth for legitimate business uses
- Preserve security by preventing employees from visiting "undesirable neighborhoods."
- Maintain the company's reputation, and reduce the threat of litigation, by preventing an unwarranted association between the company and an offensive URL



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W W W . O P S E C . C O M

Trend Transforms Firewalls into VirusWalls



Content Security

Firewalls stop unauthorized access — not viruses. A firewall fortified with Trend InterScan "VirusWall" stops viruses. InterScan, part of Trend's family of antivirus solutions for the enterprise, provides high-performance three-in-one Internet gateway protection against viruses in SMTP, HTTP and FTP traffic. InterScan pioneered Internet gateway virus scanning and today is the only product that detects and blocks HTTP traffic containing potentially harmful ActiveX and Java code.

InterScan's architecture is scalable for large to small networks. Its real-time, rule-based and pattern-recognition scanning engine technology detects and removes known viruses in files compressed up to 20 layers deep using any of 16 compression types. InterScan's MacroTrap™ technology detects known and unknown macro viruses — today's most prevalent virus type.

Firewall to VirusWall

InterScan complements the firewall in network security and delivers high-performance integrated network security when used in conjunction with a firewall.

While a firewall primarily controls outside-to-inside traffic, InterScan supplements this traffic control with virus protection and also controls inside-to-outside traffic. The InterScan product line is implemented in the form of an extranet proxy, which enables control over what users send out (e.g. viruses or email with confidential information). InterScan supplements firewall-protocol-based security with application-based security, which scans all content that passes through the firewall — blocking the entry of malicious code and barring the exit of confidential information.

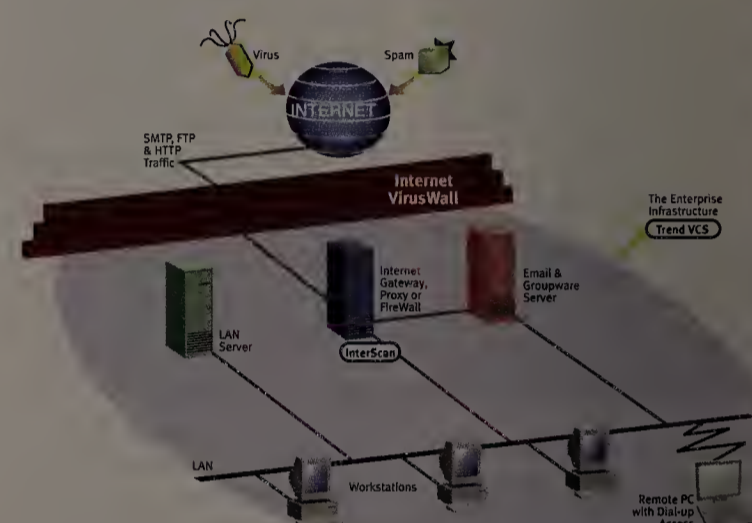
OPSEC Certification

Trend InterScan VirusWall is OPSEC certified. OPSEC is a single platform designed to allow users to integrate and manage all aspects of network security through an open extensible management framework. By selecting OPSEC-compliant products, customers are able to choose best-of-class security system components to satisfy their global enterprise security requirements.

To meet OPSEC compliance, Trend uses Check Point's CVP (Content Vectoring Protocol) API, which implements content validation and filtering of malicious message files or applet attachments. Installing InterScan with CVP support is fast, requiring the addition of a single new rule in the configuration of FireWall-1. All reporting and alerting is automatically added to FireWall-1's log for centralized management. InterScan with CVP support is usually installed on a separate content security server, but it can also be installed on the same machine as FireWall-1.

For more info:
www.antivirus.com and
www.opsec.com.

Trend InterScan products protect the Internet gateway that is open to malware attacks from SMTP, HTTP, and FTP traffic.



QUICK FACTS

InterScan VirusWall



OPSEC Integration Benefits

- This integrated approach combats two major security threats with one solution: hacker/unauthorized access and virus/malicious code attacks
- The end user enjoys an easily administered firewall/antivirus integrated solution
- Instead of testing and installing firewall and antivirus protection separately and on their own, users get a complete solution built to work together that is easy to install, deploy and maintain

Product Benefits

- Detects and removes viruses in real time from inbound and outbound SMTP email attachments —and HTTP traffic
- Blocks malicious or unsigned Java applets and ActiveX objects
- eManager plug-in prevents spammers from using your SMTP server to relay bulk email
- Optional plug-in to scan for files containing data that is not Y2K-compliant



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Leveraging the Potential of the Internet

SPECIAL ADVERTISING SUPPLEMENT



Content Security

The solution for limiting non-productive use of the Internet

The Internet is a place of incredible opportunity, but it can have a negative side as well: wasted time, loss of productivity, and access to an endless variety of subject matter, with no inherent control over who can access what or when. Effective management of Internet usage and protection against liabilities associated with uncontrolled access are priorities for businesses today. As the industry's leading server-based Internet Content Management product, I-Gear provides effective control for Internet access, with completely customizable access permissions that can be scheduled by date and time of day on a per-user, per-computer, or per-group basis. I-Gear's comprehensive scheduling and monitoring features accommodate any Internet acceptable-use policy, and flexible reporting features ensure user accountability. Plus, I-Gear is easy to administer with its intuitive, object-oriented administrative interface.

Much more than simple Internet filtering software

I-Gear differs from traditional blanket filtering products in that it combines list-based filtering with the industry's only real-time multilingual, context-sensitive filtering technology. This

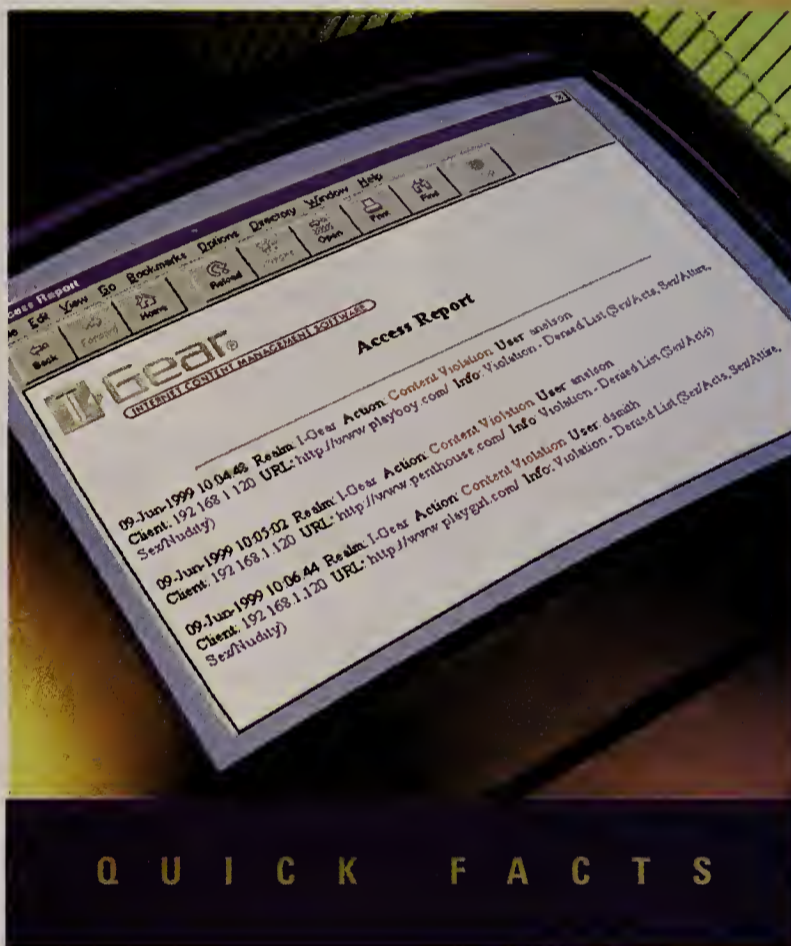
patent-pending technology, called Dynamic Document Review, or DDR, is uniquely effective in screening search engines and unrated sites with frequently changing content. DDR scans Web pages as they are downloaded from the Internet and does not simply look at key words but scores each page based on a review of the relationship and proximity of certain words to others on the page.

Feature-rich for unparalleled functionality

I-Gear supports a roaming user environment, which allows users to access their individual access permissions, bookmarks, and access history regardless of which computer is used on the network. I-Gear also includes a variety of automated policy-enforcement features. For example, Audit Mode gives users transparent, unrestricted Internet access, while I-Gear monitors Internet accesses and flags policy violations based on established filtering guidelines. AutoAlert automatically provides e-mail notification of policy violations. I-Gear's AutoLock feature can lock a user's account (restricting all Internet access until the account has been unlocked) if the user attempts to access inappropriate material.

I-Gear for FireWall-1 was developed to use the Content Vectoring Protocol (CVP) API to provide FireWall-1 customers with unprecedented functionality in an access-management solution. I-Gear can be installed on the FireWall-1 server or on its own server behind the firewall. I-Gear's dynamic Content Management features are an important continuation of the existing security features of FireWall-1.

For additional information or to download a trial version of I-Gear for FireWall-1, please visit: www.urlabs.com and www.opsec.com.



I-Gear®



OPSEC Integration Benefits

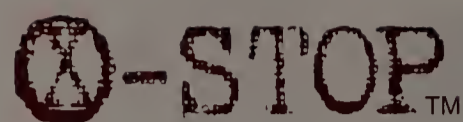
- OPSEC CVP API for more comprehensive content screening
- Dynamic Internet access control
- Seamless integration: I-Gear's OPSEC certification ensures ease of configuration and integrated functionality

Product Benefits

- Context-sensitive, real-time multilingual filtering technology, combined with extensive Content Category Lists and unlimited locally defined lists
- Completely customizable individual access rights for Internet access
- Customizable user, client, and group scheduling for single or recurring events
- Flexible, detailed monitoring and reporting of client, user, and group activity and access rights

W W W . O P S E C . C O M

Internet Content Management



Content Security

Every day more and more schools and companies with Internet access face the possibility of legal liabilities, decline in productivity, and security risk from inappropriate Internet content. X-Stop allows you to control access to Internet sites ranging from those containing pornography and bomb-making instructions to time wasting sites such as sports and chat. With X-Stop administrators can select from 31 different blocked categories, making it ideal for small and mid-size organizations that use Check Point FireWall-1.

X-Stop™ for FireWall-1®

X-Stop integrates with VPN-1/FireWall-1 via the URL Filtering Protocol (UFP) to enable category-based URL filtering. X-Stop for Check Point FireWall-1 is server based and runs in the Windows NT environment for the NT and Solaris versions of Check Point FireWall-1.

Internet Content Filter

X-Stop is fully integrated with Windows NT Proxy and Internet Information Server. New blocked sites are added and the server is updated daily, sometimes within hours of the site going online! X-Stop blocks transmission protocols such as WWW (HTTP) and FTP. X-Stop works with all web browsers and on-line services.

Search Engine Monitor

Instead of blocking thousands of search engines available, we block the words used to search for pornography on the Internet. This uses a different library than the 'foul language' filter and includes words that are OK to type anywhere else but the search engine.

Internet Traffic Monitor

X-Stop for Check Point FireWall-1 features the Internet Traffic Monitor (ITM) which clearly displays – in real time – user attempts to go to blocked sites as well as other Internet traffic. This unique monitoring system is exclusive to X-Stop.

For more information visit:
www.xstop.com and www.opsec.com.



QUICK FACTS

X-Stop™ for FireWall-1®



OPSEC Integration Benefits

- Seamlessly integrated Internet content filter
- Allows selective group filtering level with existing network object (user group)
- Allows control of Internet bandwidth usage

Product Benefits

- Block access to unwanted Internet sites
- Automatic daily download of blocked sites
- Internet real time traffic monitor



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W W W . O P S E C . C O M

Web Switches

High Availability

New Web switching technology is widely viewed as a solution to scaling the capacity and increasing the overall availability of firewalls, Web servers, caches and other Internet devices. Web switches are used to ensure high availability of firewalls by providing automatic and transparent resilience in the event of a failure. They can also be used to let firewalls operate in parallel — maximizing their performance without costly upgrades.

Alteon Web switches interoperate with FireWall-1 to provide high availability services. Individual or redundant Web switches can be deployed in front of and behind firewalls to evenly distribute user traffic among multiple devices — eliminating single points of failure.

To maintain high availability, Web switches monitor firewall health by pinging each configured interface on its partner Web switch through each firewall. By constantly performing intelligent health checks through the firewall, users are assured of the firewall's health as well as the integrity of the entire data path through the firewall. In the event of a failed device, link or port, the Web switches automatically direct traffic to a healthy firewall.

Unlike traditional packet switches, Web switches maintain the state of individual TCP sessions at Fast and Gigabit Ethernet rates. Because firewalls are stateful devices, all packets associated with established sessions must traverse the same firewall. Web switches intelligently maintain state information, ensuring that sessions established by the firewalls are maintained for their duration.

Alteon WebSystems innovated the concept of Web switching in 1998 and has pioneered the use of these new devices to optimize firewall deployment and ensure high availability. Web switches can also be used to reduce the processing-intensive traffic filtering required by firewalls. Offloading this function from the firewalls to the Web switch, where filtering can be performed in silicon, significantly increases firewall performance and speeds user traffic.

Alteon Web switches are purpose-built to deliver advanced traffic management functions, bandwidth management and URL-based content-aware switching along with traditional Layer 2 switching and Layer 3 routing at ultra high speeds. Alteon Web switches are based on a unique distributed processing architecture that employs a high performance network processing ASIC (WebIC™) on every port. This enables linear processing scalability needed to support high session rates and user traffic demands.

Web switches are now being used by E-businesses around the world, such as DLJdirect, Rogers Communications, GTE Internetworking, and IBM to optimize deployment, ensure high availability and maximize the operation of firewalls. For more information, visit: www.alteon.com and www.opsec.com.

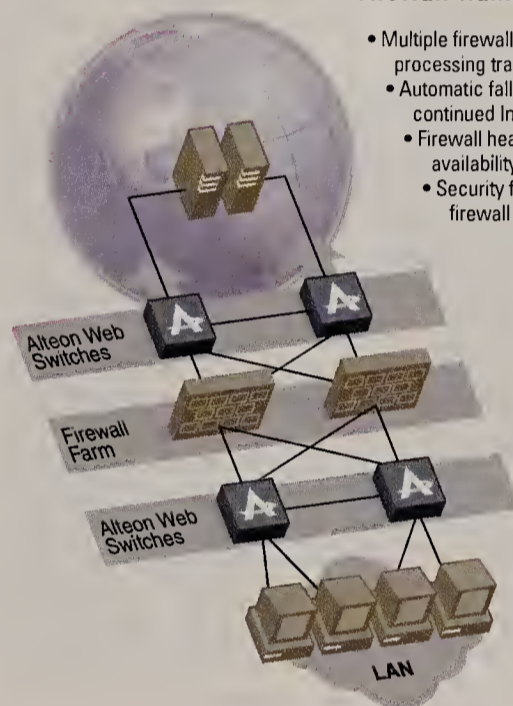


Alteon WebSystems
Web Speed for e-Business

SPECIAL ADVERTISING SUPPLEMENT

Firewall Traffic Management

- Multiple firewalls active and processing traffic
- Automatic failover ensures continued Internet access
- Firewall health checks maximize availability
- Security filtering offloaded from firewall



Q U I C K F A C T S

Alteon Web Switches

OPSEC Integration Benefits

- Ensures high availability of FireWall-1 operation through intelligent health checks and traffic distribution mechanisms
- Enhances FireWall-1 performance through parallel processing and offloading functions
- Provides optimum resilience and redundancy

Product Benefits

- Scalable, highly resilient firewall solution that delivers Web speeds and availability
- Provides unmatched processing performance and scalability
- Allows administrators to maximize investment while minimizing user-response times



W W W . O P S E C . C O M

Building High Availability Security Sites



An RND Company

High Availability

Balancing business demands against security needs has become a central theme in network administration. Firewalls are a critical part of networks that choose to participate in the global Internet community. At the same time, because most traffic must pass through the firewall, the security solution often represents a bottleneck and/or a single point of failure. Together, Check Point and RADWARE are offering a high availability (multiple firewall) security solution positioned to give network administrators a valuable weapon in the war against network downtime.

Internet Traffic Management (ITM) technology was introduced to the internetworking community in late 1996. ITM appliances add dynamic scalability, optimization of resources and fault tolerance by allowing administrators to build multi-box sites that sit logically behind the load balancer. Users approach the appliance which in turn intelligently distributes requests to these devices. ITM appliances also monitor the health of these devices to ensure that users do not go to a machine that is down or in trouble. Since the ITM appliance sits logically between the user and the content they want, it insulates the user

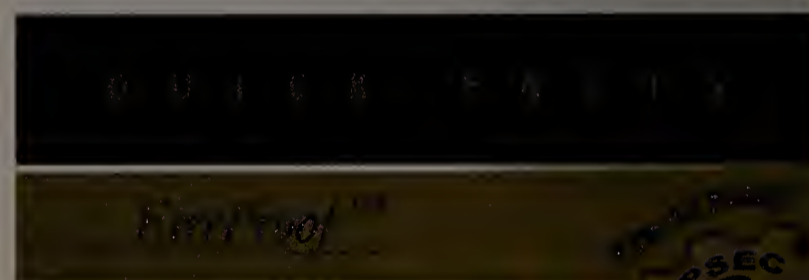
from confusion that can exist within a corporate data center. They also present a consistent performance interface to the user, something that is becoming more and more critical as users surf with a passion for response.

RADWARE's FireProof is the first ITM appliance designed to provide redundancy, fault tolerance, optimization and scalability for security devices. FireProof handles transparent as well as non-transparent traffic. A single device can handle both inbound and outbound traffic and ensure that traffic that originates through a certain firewall will return through the same device. RADWARE's ITM technology is OPSEC certified by Check Point and has been successfully installed at major sites, like E-Tour, in a Check Point environment.

About RADWARE

RADWARE pioneered the Internet Traffic Management technology field in 1997 with the introduction of the Web Server Director (WSD). Today it is the only company that offers complete ITM solutions for all local or global applications. A member of the \$3 billion dollar RAD Group, RADWARE was established in 1997 to focus on load balancing technology. RADWARE's award-winning products are installed in Fortune 500 companies and Internet Service Providers worldwide. RADWARE's products have won numerous awards, including the prestigious PC Magazine "Editors' Choice" award; Network Magazine "Product of the Year" award; Internet Computing "Net Best" award; and Network Computing "Editor's Choice", "Best Value", "Well-Connected" and "Flying Colors" awards. For more information, visit our Internet site at www.radware.com and www.opsec.com.

FireProof allows users to maximize security by unlocking firewall performance.



OPSEC Integration Benefits

- Multiple firewalls in a cluster
- Optimization of security resources
- Scalability of security resources
- Complete fault tolerance

Product Benefits

- Solid state hardware device
- Allows management of up to 100 firewalls in a cluster
- Manages both transparent and proxy firewalls

W W W . O P S E C . C O M

Staying Up and Being Fast



SPECIAL ADVERTISING SUPPLEMENT

High Availability

Whether responsible for the largest E-commerce site or a small-distributed office environment, you are faced with some of the same problems when it comes to the Internet. Customers and users want it: Available, Secure and Fast. The amount and importance of Internet, intranet and extranet traffic will only continue to grow at an ever-quickening pace. That is why more and more organizations, both large and small, are buying Rainwall as a best-of-breed solution to solve these issues. Because of our success it was no surprise when Rainwall was voted as Best-of-Show Finalist at Network+Interop '99 in Las Vegas.

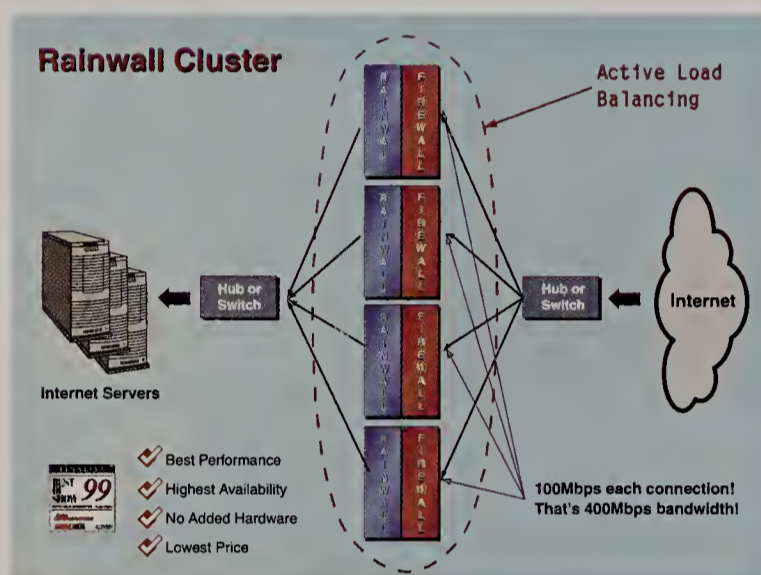
OPSEC Certification

Solving issues like availability, security, and performance is what brought RAINfinity to partner with Check Point Software Technologies Ltd. RAINfinity's Rainwall products are the next generation solution for high availability, scalability, and performance for Check Point network security gateways. By working closely with Check Point to have Rainwall OPSEC Certified, customers are assured that these products are more than compatible — they are a solution.

Rainfinity's Rainwall

Rainwall clusters have no single point-of-failure and in fact can sustain multiple server failures without ever losing a single transaction. Servers can be added to the cluster or removed without ever bringing your firewall or VPN gateway down. With Rainwall-E, all gateway servers are active, ensuring you get optimal use of your hardware and software. With RAINfinity's patented technology, as you increase the number of firewalls in your Rainwall cluster you also increase performance. This may sound obvious, but most popular solutions have inherent performance limitations, since they are based on a single MAC address and utilize more static load balancing algorithms than Rainwall. Rainwall clusters have no performance limitations because Rainwall is based on a pool of IPs. In fact the same number of gateways running Rainwall can achieve 3 to 4 times the throughput of other solutions. Of course, performance becomes especially important when deploying VPNs.

Managing Rainwall is simple and intuitive with the help of Rainwall's Java-based authenticated remote management GUI. Other advanced features include: scripting and command line interface for full control over Rainwall functionality and performance, customized icons, "drag and drop" of IP addresses from one gateway to another, and network traffic load bars. Rainwall is a software-only solution — no special hardware or dedicated heartbeat network is required — and works with both hubs and switches. As if all that wasn't enough Rainwall solutions start as low as \$4995.00 per cluster! Free download version available at www.rainfinity.com and www.opsec.com.



QUICK FACTS

Rainwall

OPSEC Integration Benefits

- Certification assures a solution
- Builds customer confidence
- Helps develop and preserve high standards

Product Benefits

- Best Performance
- Highest Availability
- Lowest Price



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W W W . O P S E C . C O M

The Internet Firewall Availability Challenge

• **RESILIENCE**

High Availability

E-commerce can't happen when the electronic door to your business is closed. It is increasingly unacceptable for your firewall to be down. *Ever.*

The hardware solution that keeps your FireWall-1 running 7x24x52

Resilience has developed a patented approach to fault tolerance that significantly reduces the entry price point for deploying non-stop servers for Internet and other mission-critical applications. It is now possible to inexpensively deploy a system that will never stop running due to *any* hardware problem or failure. In addition, our appliance-like approach means the system can be installed in half an hour, and will never require any of the complicated, high-maintenance support associated with "high availability" failover systems. Resilient servers are OPSEC certified for FireWall-1 (and are guaranteed to run any application capable of running under the standard Solaris operating environment, *unmodified*).

To provide maximum uptime for critical applications, Resilience employs a Triple Modular Redundant (TMR) architecture. Three identical system modules on a passive backplane exe-

cute the same instructions simultaneously. All I/O transactions are compared in real time. Any deviation causes the offending module to be disabled, while the application software (FireWall-1 in this case) continues to run uninterrupted. Maintenance can occur while the application runs, since each system module is hot swappable and field replaceable. Ethernet and other I/O sub-systems are also hardened to ensure no application downtime.

Beyond High Availability

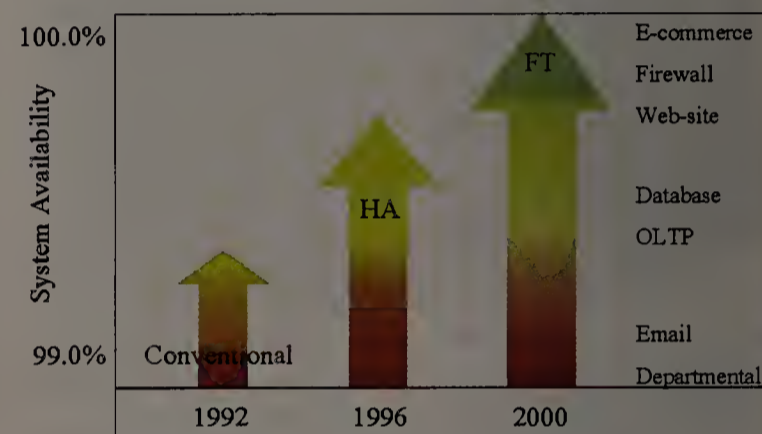
Clustered "high availability" implementations are designed to enable recovery from hardware failures, but the applications must be restarted. Memory contents, state information, communication messages and in-flight transactions can be lost. In an ideal HA implementation, the application can be restored in a matter of minutes. However, the database and file systems often need to be recovered, or the restart isn't smooth. These interruptions are painful and costly as businesses move toward Internet speed and E-commerce. Resilience's simple and elegant "appliance" approach simply removes this exposure from the table.

Resilient Fault Tolerant servers, combined with Check Point FireWall-1, provide the best of both worlds:

- Your firewall never goes down due to a hardware problem.
- The high cost and ongoing complexity of HA failover are avoided.

And the best news is that you can deploy this solution in the time it takes to read this article and save your systems staff to fight other fires. When your firewall and other key applications absolutely, positively have to stay up, check us out at www.resilience.com and www.opsec.com.

Server Hardware Availability Requirement Trend



Q U I C K F A C T S

Resilient FireWall-1 Server

OPSEC Integration Benefits

- Resilient servers are OPSEC certified for FireWall-1
- FireWall-1 with Solaris is guaranteed to run on any Resilient Fault Tolerant Server
- Simple and scalable integration

Product Benefits

- Hardware failures will never interrupt your firewall ... ever!
- Simple, elegant, and inexpensive to deploy
- Easy to install and no intricate HA management or setup



W W W . O P S E C . C O M

The Scalable High Availability Solution

STONESOFT

SPECIAL ADVERTISING SUPPLEMENT

High Availability

Once connected to the Internet and running an increasing number of business-critical applications, corporations face new requirements for their network security: Connectivity and throughput become a critical matter as the Internet is increasingly the primary means not only for communications but also for everyday business transactions.

Building a High Availability (HA) firewall is a way to avoid the single point of failure within network connectivity. E-commerce and E-banking solutions are most in need of HA firewalls, but the need is also increasingly present with ISP & MSP services as well as with VPN deployments. Practically any corporation running business-critical applications needs an HA firewall system.

When choosing a High Availability solution for a corporate firewall, the following issues should be considered:

- Transparency; is the HA solution transparent for network users?
- What is the actual recovery time and do existing connections survive if one or more gateways crash?
- Are any shared or external devices required other than firewalls themselves?

- Is the system scalable if more throughput is required later on?
- Is it possible to do on-line maintenance including initial implementation?
- Does the system restrict using full functionality of firewall or other third-party software?
- Is the failure detection system configurable and is it designed for firewall use?

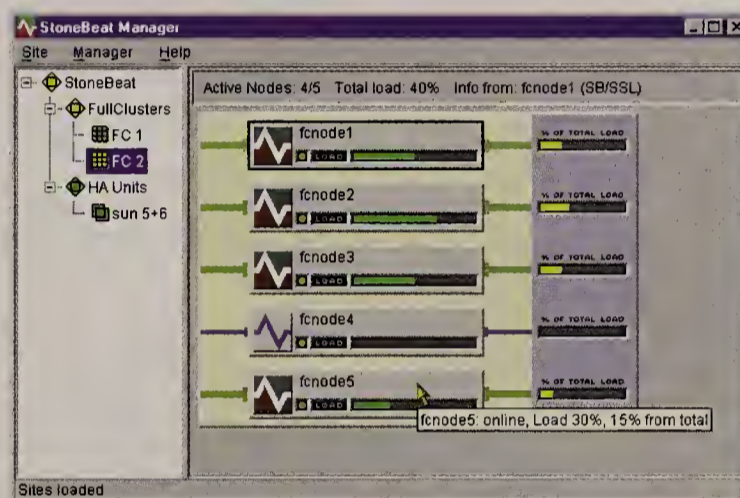
StoneBeat's scalable High Availability solution is designed and OPSEC certified for FireWall-1. StoneBeat interconnects multiple FireWall-1 systems to create a scalable firewall cluster enabling unparalleled performance, scalability and flexibility.

StoneBeat supports VPN-1™ failover and all connections, including encrypted ones, will be preserved in the VPN-1/FW-1 switch-over. StoneBeat does not create the vulnerability to asymmetric routing problems that happens with other products claiming to have a similar functionality.

The StoneBeat system provides clustered high availability services for FireWall-1 systems. When the network traffic increases, it is easy to install more FireWall-1 gateways to the existing cluster. The StoneBeat cluster has a single gateway identity and adding new nodes does not require reconfiguration of routers, as solutions based on virtual IP addresses or dynamic routing protocols do. New nodes in the StoneBeat cluster configure themselves automatically when added due to special features of the StoneBeat traffic management & clustering algorithm. They also enable different models of hardware to be deployed within the same cluster.

For more information, visit:
www.stonesoft.com and
www.opsec.com.

One of the many features of StoneBeat is the user-friendly GUI.



Q U I C K F A C T S

StoneBeat™

OPSEC Integration Benefits

- Protects the FireWall-1 site against hardware and software failures
- Enables on-line maintenance
- Completely transparent, no routing arrangements or other network configuration required

Product Benefits

- Completely configurable failure detection system with rich set of built-in tests available
- Hot-Standby, Active Traffic Management configuration options in one product
- Clustering enables up to 1GB throughput: up to 16 nodes can be clustered under one FireWall-1 identity



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W W W . O P S E C . C O M

Monitoring Firewall Events in Realtime

**micro
muse**

The Netcool® Company

Reporting and Analysis

As business use of the Internet explodes, every organization's success depends on its ability to manage the associated security risks. As firewalls proliferate and the networks they safeguard expand, one key challenge for network operations managers is to sustain the availability of all firewall-related security services. In high-growth networks — such as electronic commerce or Internet service provider environments — it is imperative that managers are able to monitor and resolve network-related events that result in the outage of business applications or services.

The rise of E-commerce demands that operations managers have tools that are easy to install, configure, and deploy. Netcool applications, which deploy off the shelf and are easy to configure, were developed with that in mind. Micromuse's Netcool®/FireWall-1® monitoring application collects security information from Check Point FireWall-1 platform and integrates it with the Netcool fault and service-level management application, providing a complete end-to-end view of enterprise events.

By allowing all security events to be viewed together in precise service-specific views, the Netcool/FireWall-1

Monitor reduces the risks associated with operating in secure computing environments. The Netcool! ObjectServer™ is a memory-resident database that collects and consolidates high volumes of event information. The Netcool/FireWall-1 Monitor pushes firewall events into the ObjectServer and distributes views of security-related information to firewall operators.

Adaptive Firewalling

Netcool/FireWall-1 adds a level of security via adaptive firewalling. The Monitor detects an internal or external breach of the firewall network and raises an alert through the security operations center. An automation can then be enacted to deal with the intrusion according to the organization's security policy.

The Netcool/FireWall-1 Monitor does not rely on state models, known attack type look-ups, or even attack signature types. Instead, it offers an abnormal behavior classification, covering known and unknown types of computer misuse. These might include persistent or sophisticated attacks or application misuse. Firewall operators see all security-related events deduplicated and correlated at relevant levels of security. At each level is a defined action that can be automated or manually addressed by the operator.

In addition, Netcool/FireWall-1 has the ability to support a hierarchical multiple firewall architecture, to ensure that there is no single point of failure. Decisions regarding security can be made regarding infrastructure, technology choices, policy changes, or physical security. From this, firewall operators can create meaningful real-time pictures of how security services are performing across the enterprise. www.micromuse.com and www.opsec.com.

Clicking on a Netcool/FireWall-1 service summary brings up an Event List showing all Check Point events.



Q U I C K F A C T S

Netcool®/FireWall-1

OPSEC Integration Benefits

- Compliance with industry-leading OPSEC Alliance
- Reduced security risks for managers of OPSEC environments
- Ability to leverage OPSEC's SAM and LEA APIs

Product Benefits

- Provides realtime security operations reporting and monitoring
- Allows operators to rapidly identify which IT services are affected by which faults
- Pinpoints sources of network problems, automates operator responses, and facilitates problem resolutions
- Deploys off the shelf, providing a rapid return on investment



W W W . O P S E C . C O M

Smart Cards For Convenient and Secure Access to VPN-1

Datakey®

PKI

More and more, organizations are combining virtual private networks (VPNs) with public key infrastructure (PKI) to ensure private communications and verify user identity for secure business to business E-commerce. The PKI generates a user identity via a digital certificate which can be conveniently and securely stored on a smart card for authenticating VPN users from anywhere in the world. In addition to providing secure storage of a user's identity, smart cards offer VPN users greater mobility because they can carry their identities with them wherever they go.

Datakey, Inc.'s smart card security solution, SignaSURE™ CIP, is a recent addition to the OPSEC Alliance. Integrated with the latest Check Point VPN-1 Certificate Manager™ technology, Datakey's smart cards are a critical component of a Secure Virtual Network™ (SVN), providing the highest level of strong user authentication and access control. SignaSURE CIP software installs easily at a user's workstation and is transparent to the user. Within VPN-1 SecuRemote™, the user receives their certificate from the VPN-1 Certificate Manager and requests that it be loaded onto the smart card. The user can then easily

connect to their network through any workstation equipped with a reader since they can carry their smart card – loaded with their digital certificates – wherever they go.

Another key advantage of smart cards over other hardware authentication devices is the ability to add or integrate other applications into the card. Smart cards can be custom-formatted with company-specific artwork, magnetic stripes or proximity technology for building access, and bar codes or pictures for personal identification.

Datakey provides industry-leading smart card security

Security That Is One Step Ahead of the Pack – To date, hackers have been unable to crack RSA key lengths of 1024 bits. Yet Datakey's smart cards provide security that's twice as strong, using RSA key lengths up to 2048 bits. *On-Card Storage Space to Spare* – Datakey's most advanced smart card provides 32 K-bytes of EEPROM storage, enabling more than enough space for multiple key pairs and multiple certificates as well as other data on each smart card.

Standards-Based Solution Allows Seamless Integration With Multiple Applications

- Check Point VPN-1 Certificate Manager
- Entrust/PKI™ and all Entrust™ Ready applications
- Suppliers of commercial and private X.509 certificate services like Baltimore, Cybertrust, ID Certify, Thawte, Xcert, and many others
- Client applications such as popular email and Internet forms software

Find out more about Datakey's smart card-based information security solutions at www.datakey.com and www.opsec.com.

Q U I C K F A C T S

SignaSURE™ CIP

OPSEC Integration Benefits

- Provide one authentication mechanism for both internal and external VPN-1 users
- Single-card solution for a wide range of security applications including VPN-1 authentication, secure email, SSL client authentication, etc.
- Datakey smart cards provide VPN-1 users with the portability to access their network from any workstation

Product Benefits

- Incredibly flexible, strong authentication solution
- Convenient network access from anywhere
- Highly secure and widely integrated with many popular applications
- Smart cards can be used to control network access as well as access to corporate facilities

Security Infrastructure from the Most Trusted Name in E-security



PKI

You've heard about the complex PKI products available today that organizations like yours have struggled to implement. Now there's a solution. RSA Security, the inventors of Public Key Cryptography has delivered RSA Keon™ – the most comprehensive and easy-to-use PKI solution available. Functionality without ease-of-use isn't powerful. RSA Keon delivers both. RSA Keon is seamlessly integrated into Check Point's FireWall-1 and VPN-1 products as well as dozens of other leading applications. Now you can have the power of PKI without the hassles of first-generation products.

RSA Keon™ Certificate Server

RSA Keon™ Certificate Server is a robust system that unites a key management engine, a certificate engine, an LDAP certificate repository, and a certificate revocation database together into a single, powerful package. With RSA Keon Certificate Server an organization can define and administer their own security procedures, trust relationships, certificate formats and rules for certificate lifecycles. Organizations can easily install the RSA Keon Certificate Server into

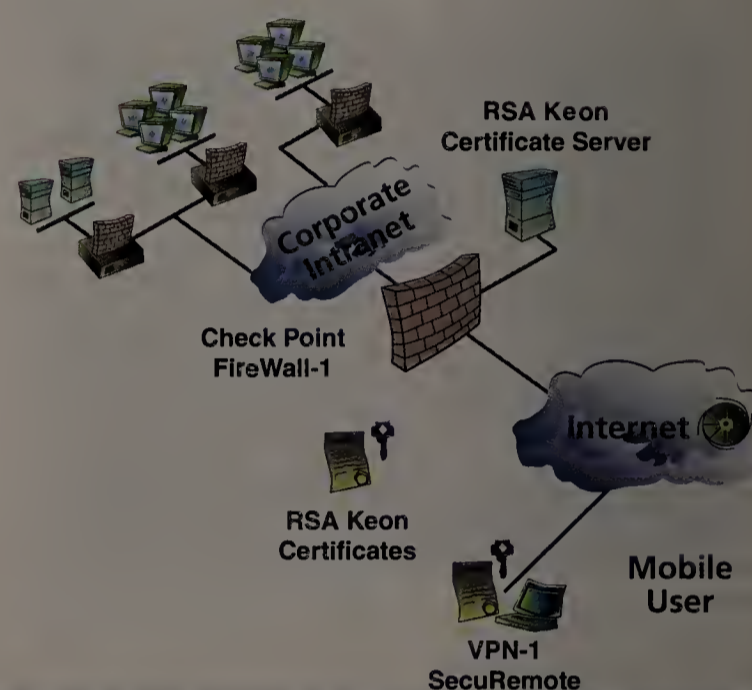
their existing networks and use it across a broad range of PKI-enabled applications, including Web access using SSL, Virtual Private Networks using IPSec and secure email using S/MIME, as well as custom enterprise applications. In addition, software developers and ISVs needing to add certificate server functionality to their products can easily integrate the RSA Keon Certificate Server right into their applications. Optional Keon modules and RSA BSAFE™ developer tools provide complete security for existing enterprise applications and custom application development.

Check Point Integration

For organizations deploying Virtual Private Networks the combination of Check Point's VPN-1 and the RSA Keon Certificate Server provides a highly scalable VPN solution for secure business communications over the Internet. Certificates for site-to-site VPNs can easily be acquired by administrators and issuing certificates to remote VPN clients is easily accomplished using RSA Keon Certificate Servers Web-based enrollment system. Ongoing administration costs are greatly reduced through RSA Keon's transparent and fully automated key and certificate management capabilities. RSA Keon Certificate Server can also be easily customized to an organization's security policy and end-user needs.

For more information on RSA Keon Certificate Server, please call, 800-495-1095 (Ref code 100) or visit us on the web at: www.rsasecurity.com/go/networld/ and www.opsec.com.

RSA Keon Certificate Server



QUICK FACTS

KEON™

OPSEC Integration Benefits

- RSA Keon's Standard-based PKI approach leverages the investment in your existing Check Point infrastructure
- Interoperates with Firewall-1 and VPN-1
- Scalable PKI solution that allows support of certificates for IPSec authentication

Product Benefits

- Flexible: Modular standards-based approach protects the investment in your existing infrastructure
- Simple: Integrates easily with your existing applications and is fully customizable
- Unique Developer Solution: Create open, PKI-enabled E-commerce applications with RSA BSAFE, the most widely used encryption and PKI toolkits

Compaq Security Solutions — Securing the Enterprise

SPECIAL ADVERTISING SUPPLEMENT

COMPAQ

Servers

Research and development, trade secrets, confidential industry information are all being shared globally more than ever before in the Internet marketplace. Unfortunately, this presents substantial security risks as information and the systems it resides on are both valuable and vulnerable. Compaq security solutions enable you to quickly, easily and affordably conduct business on the Internet knowing your data and corporate networks are safe and secure.

Successfully managing risk related to information systems requires a well thought out security policy that matches the security needs of the company. Operating within the OPSEC framework, Compaq provides guidance on building a complete security policy.

Compaq and Check Point Deliver and Drive Industry Standard Solutions

As a member of Check Point's Open Platform for Security (OPSEC), Compaq works closely with Check Point to test and integrate Compaq hardware with Check Point software applications to ensure seamless integration and interoperability into a net-

work infrastructure. Check Point has selected Compaq as their Microsoft Windows NT® reference platform and has based the NT section of the OPSEC lab entirely on Compaq servers. This collaboration gives information managers the advantage of a fully tested and seamlessly integrated security solution.

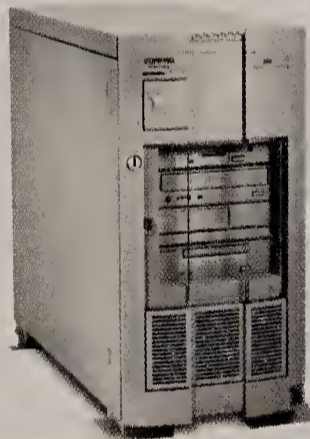
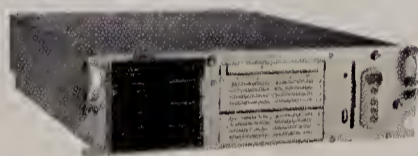
Compaq ActiveAnswers Solutions

Compaq and Check Point jointly developed ActiveAnswers solutions that feature Compaq ProLiant servers and Check Point FireWall-1 for Windows NT and Check Point VPN-1 software. These solutions provide information and methodologies for planning, deploying, and operating a Check Point firewall and VPN as part of a comprehensive secure virtual network architecture. These materials include installation guides, performance papers and sizing tools to ensure customers get the solution most appropriate for their needs.

You can be sure your firewall and VPN have been thoroughly tested and proven, and confident that it will meet your needs — from access control to authentication and encryption to network address translation. You can count on your system to be sufficiently scalable, upgradable and expandable to meet your changing requirements.

For more information on Compaq ActiveAnswers for Check Point FireWall-1 for NT and Compaq ActiveAnswers for Check Point VPN-1 solutions, visit: www.compaq.com/activeanswers/ and www.opsec.com.

Compaq ProLiant Products



Q U I C K F A C T S

Compaq ActiveAnswers



OPSEC Integration Benefits

- Collaborative product testing to deliver proven firewall and VPN security solutions
- Assurance of a smooth integration with the other best-of-breed products in the OPSEC list
- Ongoing testing and development of leading edge solutions from Compaq and Check Point to meet evolving needs of Internet security customers

Product Benefits

- Combine the advantages of Check Point FireWall-1 and VPN-1 with the world-class reliability, scalability and performance of Compaq ProLiant Servers
- Enable global implementation through Compaq's worldwide services and full lifecycle support

W W W . O P S E C . C O M

Nokia IP Security Solutions

NOKIA
CONNECTING PEOPLE

Network Appliances

Nokia IP Security Solutions offer a comprehensive line of products for Internet security applications. We combine world-class routing capabilities with the best-of-breed firewall software from Check Point. The fully integrated virtual private network solution introduces a new level of simplicity in deploying firewalls and VPNs. Additionally, Nokia supports true high-availability through the combination of the Virtual Router Redundancy Protocol (VRRP) and Check Point FireWall-1 Synchronization.

Nokia IP Security Solutions – Products

- IP650 – networking security functionality in a carrier-class package
- IP440 – optimized for Internet applications requiring performance
- IP330 – low cost, simple-to-deploy FireWall-1 in an all new form factor
- VPN200 Series – integrated VPN appliances to fit any budget

OPSEC Integration

You need complete integration to keep costs down, but you also need extensibility to preserve the ongoing value of your capital expenditures. And you need this in connection with

some of the most complex elements of your network—security and routing. You are drawn to Nokia's IP Security Solutions because they allow you to deploy Check Point VPN-1 and FireWall-1 very quickly, keeping pace as your business scales up. The firewall software is completely integrated with a hardened routing OS and high-speed networking hardware, all preloaded and tested at the factory. You know from experience that this dramatically lowers your costs compared with the old method of integrating all of these elements in the field. Yet you may also need to plug into other capabilities and products on the network. How can you possibly do this?

The combination of OPSEC and Nokia IP Security Solutions allows you to realize the benefits of complete integration of the market leading security software with world-class IP routing on high-performance networking platforms. Nokia IP Security Solutions are designed to let you choose a firewall that meets the demands of your business, whether you need to optimize for cost, need top performance, or great diversity of interface choices. Whether you are deploying a redundant configuration of systems to create a highly available Virtual Private Network or a customer premise-based managed firewall service, you know that OPSEC means that you have guaranteed interoperability with any OPSEC-certified applications you need to run your business.

For more information visit:
www.iprg.nokia.com and
www.opsec.com.

Nokia IP Security Solutions offer a new level of simplicity in firewalls and VPNs.



QUICK FACTS

Nokia IP Security Solutions



OPSEC Integration Benefits

- Simple Extensibility for an Integrated Security Appliance
- Certified Interoperability with OPSEC-Certified Applications
- Capabilities of systems you deploy today continue to grow over time

Product Benefits

- Complete Implementation of Check Point VPN-1 and FireWall-1
- Secure High Availability VPN and Firewall Solutions
- Full Integration means Rapid Deployment and Simple Maintenance
- Multiple product families covering a broad range of price & performance

W W W . O P S E C . C O M

GTE Network Operations Center



INTERNETWORKING
POWERED BY BBN

SPECIAL ADVERTISING SUPPLEMENT

Managed Services

Everyone knows that the Internet can be used to conduct E-business to deliver products and services in new ways and to allow organizations to communicate and collaborate more efficiently. But the Internet can also pose risks to your organization's computing infrastructure in the form of hackers who want to steal or corrupt your valuable information assets, or damage the applications that your business relies on every single day. In order to thwart potential attacks on your network, you need an effective network perimeter security solution – and that's where GTE Internetworking comes in.

GTE Internetworking's Site Patrol for FireWall-1 family of managed Internet security services and solutions can help guard your network perimeter around the clock, around the world. Site Patrol for FireWall-1 provides the broadest range of solutions in the market today, giving you wide flexibility in choosing the managed Internet security service that's right for your organization's business and technical requirements.

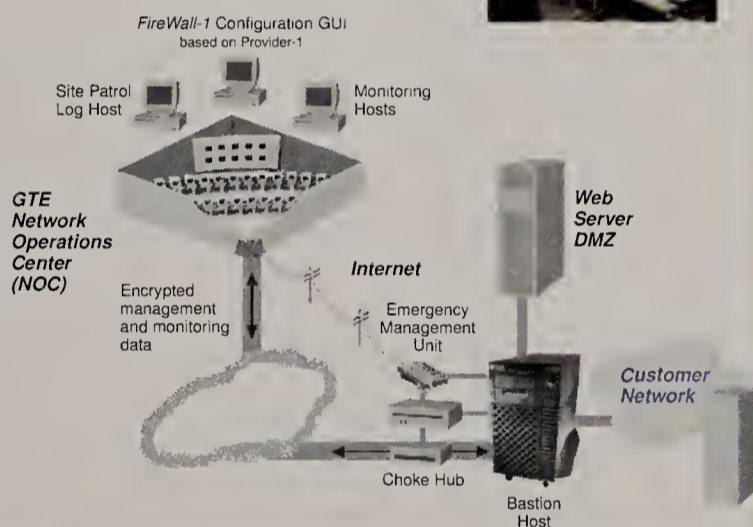
From our state-of-the art Network Operations Center, GTE Internetworking – a trusted provider

of security solutions worldwide – monitors your network perimeter 24x7 using sophisticated tools and techniques. Our security experts act as an extension of your team to protect the availability, confidentiality, and integrity of your information assets.

Our OPSEC-compliant, full or co-managed turnkey solutions include 24x7 proactive monitoring and response, security policy configuration and management, Check Point FireWall-1 software and hardware, installation, and ongoing software and hardware maintenance. Our service-only offerings allow you to procure your own FireWall-1 software and hardware and partner with GTE Internetworking for value-added monitoring, maintenance, management, and response services.

Network security is not something you can learn either overnight or on-the-fly. GTE Internetworking – formerly BBN, the Internet pioneer – has been providing Internet security to hundreds of organizations for more than 20 years. Site Patrol is currently installed in more than 400 locations around the world, from private companies and educational institutions to Fortune 100 corporations in banking, finance, healthcare, retail, wholesale, and high tech.

For more information about GTE Internetworking's Site Patrol for FireWall-1 managed Internet security solutions, contact us at:
Phone: 1-800-472-4565
Web: www.bbn.com and www.opsec.com
Email: net-info@bbn.com



QUICK FACTS

Site Patrol for FireWall-1®

Service Benefits

- **24x7 Global Security Solution:** Allows you to focus IT resources on your core competencies
- **Full or Shared Management:** A fully managed solution means we do all firewall configuration and security policy changes; with our shared managed solutions, you retain control over these functions so you can make changes as you prefer
- **Event Escalation Procedures:** Classification and escalation of all incidents based on your security policy
- **Security Incident Rapid Response (SIRR):** Policies and procedures for responding to security incidents means quick and formalized actions are taken to safeguard your network
- **Global security implementation:** A consistent security policy can be implemented worldwide
- **ISP Independence:** Allows you to use GTE Internetworking's connectivity or the ISP of your choice – no RFP's, no new installs, no hassles
- **Y2K-Compliance:** Ensures your security will be safe for the new millennium



W W W . O P S E C . C O M

Certified and Secured OPSEC Solutions

Best-of-breed products and services that carry these OPSEC symbols seamlessly integrate to give you the highest possible performance.

Visit www.opsec.com today for free downloadable software and information on over 200 companies committed to developing integrated products for your network security.



FRAMEWORK

Integrated security solutions

AUTHENTICATION

ActivCard Token
AXENT Defender Security Server
Blockade Enterprise Security Server
CryptoCard CRYPTOServer
Funk Steel-Belted Radius
LeeMah DataCom TraqNet 8000
Netegrity SiteMinder
RSA Security ACE/Server
Secure Computing SafeWord
Vasco Corporation VACMan

CONTENT SECURITY

Aladdin Knowledge Systems
 eSafe Protect Gateway
Aliroo PrivaWall
Computer Associates SafeGate
Content Technologies
 MIMESweeper for FireWall-1
Finjan Software SurfinGate
JSB Software SurfCONTROL
JSB Software
 SurfWatch for FireWall-1
Log On Data X-STOP for FireWall-1
Secure Computing Smart Filter
Symantec
 Norton AntiVirus for Firewalls
Trend Micro InterScan VirusWall
Symantec I-Gear
Websense Websense for FireWall-1

DIRECTORY MANAGEMENT

IBM SecureWay Server
Innosoft
 Innosoft Distributed Directory Server
Netscape Directory Server
Novell NDS

EVENT ANALYSIS AND REPORTING

Micromuse Netcool/FireWall-1
Sane Solutions
 NetTracker 4.0 Enterprise
VeriSign Firewall HealthCHECK
VeriSign SecureVIEW
Telemate.Net Software
 TELEMATE.Net
WebTrends
 WebTrends for Firewalls and VPNs

INTRUSION DETECTION

Check Point RealSecure
Computer Associates SessionWall-3

HIGH AVAILABILITY

Alteon WebSystems ACEdirector
Legato Systems FullTimeHA+
Marathon Endurance 4000
Nokia IP Security Solutions
RADWARE FireProof
RAINfinity Rainwall
Resilience
 Resilient FT Firewall Server
RSi Solutions RSF-1
Stonesoft StoneBeat
Veritas FirstWatch

PKI

Baltimore UniCert
Datakey SignaSURE CIP
RSA Security Keon
Netscape Certificate Server
VeriSign OnSite

TECHNOLOGY

Chrysalis-ITS
 Check Point Accelerator Card
RSA Security BSAFE SSL-C

PASSPORT

Integrated application management

MULTIMEDIA

BackWeb Technologies
 BackWeb Channel Server
Clarent VoIP Gateway
FreeTel Communications
 FreeTel Personal Edition
Microsoft NetMeeting
Microsoft Windows Media
Netscape Communications
 CoolTalk
Netscape Communications
 Communicator
Netscape Communications
 Conference
PointCast PointCast Network
Real Networks RealAudio
Sitara SpeedServer/SpeedSeeker
VDOnet VDOLive
Vosaic Vosaic Media Suite
VXtreme Web Theater
White Pine CU-SeeMe
White Pine Reflector
Xing StreamWorks

DATABASE

Oracle Corporation SOL*NET
Sybase jConnectTM for JDBC
Sybase Open Client
Sybase SQL Server

GROUPWARE

Campbell Services
 OnTime Enterprise NT
Iona Technologies Orbix

OTHER SECURELY MANAGED APPLICATIONS

Citrix WinFrame
e-motion Creative Partner
iPass Corporate Access
Symantec pcAnywhere
Symantec pcTelecommute



INFRASTRUCTURE

Integrated Check Point platforms

NETWORKING

Alcatel OmniSwitch and PizzaSwitch
FORE Systems ESX Switches
Nokia IP Security Solutions
Nortel
 Networks for BN, ARN & System 5000
ODS Networks SecureCom

SERVERS

Compaq ProLiant
Dell PowerEdge
IBM VPN-1 & FireWall-1 for RS/6000
Hewlett-Packard NetServer
Hewlett-Packard 9000 series
NCR Corporation WorldMark Server
Sun Microsystems
 FireWall-1 for Sun/OS
Sun Microsystems
 FireWall-1 for Solaris



MSP PARTNERS

Complete managed services

MSPs

Cable and Wireless IP VPN and Managed Firewall Service
GTE Internetworking Site Patrol for FireWall-1
Intermedia Communications Secure Managed Firewall
Madge Networks Managed Firewall Service
ISS eServices Managed Firewall Service
Sprint IP Security Server
Swisscom AG SecurePoP
UUNET InterManage

P/N 393000015

W W W . O P S E C . C O M



Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

Enhanced Software Technologies (EST) and Red Hat Software last week said they would partner to deliver EST's backup and restore utility to Red Hat Linux users. As part of the partnership, Red Hat will include a trial version of EST's Backup and Recovery Utility (BRU) with its Linux Applications CD. The CD is available with Version 6.1 of Red Hat Linux. In addition, Red Hat users can download EST's Crash Recovery Utility for Linux, a tool for reviving downed servers, from the Red Hat Web site.

Red Hat: www.redhat.com

Cisco last week announced a definitive agreement to acquire publicly held **Aironet Wireless Communications** of Akron, Ohio, for \$799 million in stock. Aironet is a developer of high-speed wireless LAN products. Its product portfolio includes wireless adapter cards and "access points" that tie together wired infrastructures and manage wireless LAN traffic. Aironet also makes wireless bridge products that provide point-to-point or point-to-multipoint connections among buildings.

IBM last week rolled out a new version of its Small Business Suite for Windows NT servers that lets small to midsize businesses set up and manage their own Internet commerce sites. The suite, Release 1.5, bundles a trio of server applications, including Lotus Domino Release 5 application and messaging server; WebSphere Application Server, Standard Edition Version 2; and DB/2 Universal Data Base 6.1.

Small Business Suite for Windows NT 1.5 is available now and costs \$90 per desktop client and \$499 per server for a maximum of 100 users.

IBM: www.ibm.com

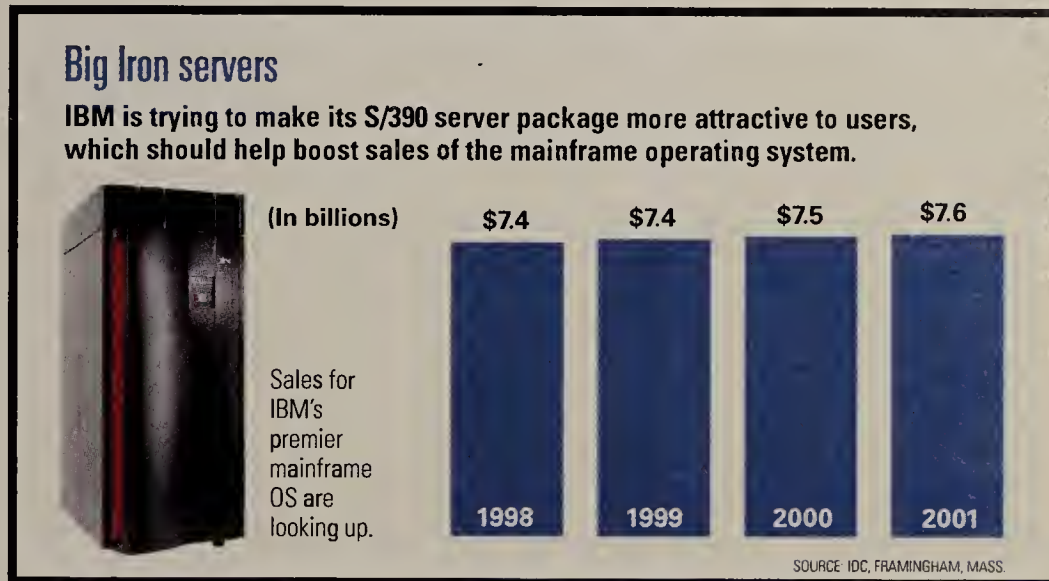
IBM pack simplifies Web app deployment

BY MARC SONGINI

IBM wants to help S/390 users get their legacy applications out on the Web without the heavy lifting.

Recently, the company announced its S/390 Application Development Solution (ADS) — a turnkey system that includes a small mainframe bundled with development software dedicated to the crafting and testing of electronic commerce and other applications. IBM says ADS will safely reduce the time it takes for customers to perform tasks such as Webify a 3270 or CICS application.

The ADS offering comes with popular host and client software, preloaded and configured on an S/390 Multiprise 3000, a recently announced smaller mainframe for midsize workgroups or networks. Customers can use the server to write



and test applications, then port them to their regular S/390 servers.

The company claims that the ADS

offering can also save users up to two-thirds the cost of purchasing all the individual components. See **IBM**, page 24

Users to 3Com: We really need to talk

For starters, customers want faster product upgrades and better support.

BY JIM DUFFY

CHICAGO — 3Com customers are anxious for the company to ship some next-generation products and resolve certain issues regarding product updates, integration and bug fixes.

While generally satisfied with 3Com products and their relationship with the company, some users at the company's Networks3 conference here are nonetheless dissatisfied with the amount of time it takes to get key product upgrades, enhancements and support issues resolved.

Quad/Graphics in Pewaukee, Wis., for example, is frustrated that 3Com's Dynamic Access Network Performance Manager (NPM) software is still not shipping. NPM works with 3Com network interface cards to monitor and report application performance in switched networks.

The software was announced in June and was supposed to ship in the third quarter of this year. But now it appears NPM won't ship until the first half of next year, according to Dave Goetzel, IS manager at Quad/Graphics.

"I'm actually saddened a little to hear how long it's going to take them to get

NPM as a product," he says. "You'd think that they'd be throwing everything possible at it to get this thing out before somebody else."

3Com officials say they've delayed NPM until the first quarter of 2000 to add new features and ensure the quality of the software.

Goetzel also feels 3Com in general does not devote the resources necessary

to the products that are important to Quad/Graphics. One such product is the SuperStack II PathBuilder 330 WAN switch and its voice compression module (VCM).

"We've been kicking the 330 around in our demo lab for six to eight months now," Goetzel says. "This VCM card comes out, and it's so buggy it's pathetic. They don't throw resources at things the way they should, until you're disgruntled and ready to threaten Lucent on them. [Then they say] 'Well, wait a second now, we'll look at it for you.'"

Other users also expressed a desire for 3Com to be more proactive in notifying them of product updates, upgrades and bug fixes. Terry Kester, senior manager of computer operations at US Sugar in Clewiston, Fla., says it's hard for him to track down 3Com product updates, a sentiment echoed by the University of Wisconsin at Green Bay.

"I don't have time to look for updates, they've got to come to me," says David Kieper, associate director for IS at the university. "There's nothing worse than [3Com] saying, 'Yeah, we fixed it, but we're rolling that into the next release that's six months away.'"

See **3Com**, page 20

Wish list

3Com users want the company to focus on the following:

- Continue to build redundancy into its product line.
- Deliver new management applications quicker.
- Coordinate and collaborate product development among 3Com divisions and business units.
- Proactively notify customers of product updates and bug fixes.
- Develop management tools for multimedia applications.
- Better integrate acquired companies and product lines.

Microsoft sets pricing for Win 2000

BY JOHN FONTANA

After recently cementing the ship date for Windows 2000, Microsoft has detailed pricing for the operating system, including a change that requires a license for users authenticating to the server over the Internet.

prise customers will have the option of licensing a maximum number of concurrent users per box or purchasing an all-you-can-eat Internet Connector license.

The connector license, which is priced at \$2,000, is a flat per-server charge that allows an unlimited number of

radical a departure from other systems such as Unix, AS/400, Open VMS and mainframes. It looks like it is trying to strike a balance between either paying on the desktop or paying on the server."

Microsoft says the change in the Client Access License (CAL) reflects the way enterprises will use the servers on the Internet. The company also says the new licensing satisfies customer demand for a simplified licensing model.

"We are moving to clarify when the CAL is needed," says Steve Stanzel, product manager for Windows 2000. "If a user is getting an [authentication] credential from Active Directory, then the CAL is needed."

With e-commerce or collaboration applications, for example, users from outside a corporation's walls may need to authenticate themselves before accessing applications or data. Users who make anonymous connections to a Web server running on Windows 2000, which ships Feb. 17,

2000, will not need a CAL.

This is the first time Microsoft has announced pricing before the launch of a product. "We wanted to give customers the chance to do their budget planning," Stanzel says.

The suggested pricing for the desktop Professional edi-

tion of Windows 2000 starts at \$319. Pricing for the Server Edition starts at \$1,199 with 10 CALs. The Advanced Edition of the server starts at \$3,999 with 25 CALs. ■

Price plans

Microsoft released general pricing for the Windows 2000 platform recently. Estimated retail pricing for the desktop and server versions, due to ship on Feb. 17, 2000, is shown below. Enterprise users will get volume discounts.

Product	Replaces	Price	Upgrade price
Professional	NT Workstation	\$319	\$149
Server Edition	NT 4.0	\$1,199	\$599
Advanced Edition	NT Enterprise Edition	\$3,999	\$1,999

The change will be of interest to enterprise customers who have heavily used electronic commerce sites and are planning to upgrade from Windows NT 4.0 to Windows 2000. Enter-

users to authenticate to a Windows 2000 server.

"Microsoft is trying to do value-based pricing," says Joe Clabby, an analyst with Aberdeen Group in Boston. "What it is doing is not that

3Com,
continued from page 19

3Com officials say the company has been offering a comprehensive, easily accessible artificial intelligence-based repository of product incidence and resolution information for more than a year. The officials say they have tried disseminating this information via push technologies, but it was difficult to deliver the specific information customers wanted or needed without deluging them with data.

Kieper also expressed frustration in the time it takes to receive management software for a new 3Com switch. The lag can be as long as a year, he says.

"I think 3Com's putting out some good hardware but their management software's been late," he says. "I had one of the first CoreBuilder 9000s that was produced, but it came and you couldn't manage the thing at all. It took a year to get the management software."

3Com officials say the lag between shipment of the CoreBuilder 9000 and its management applications was only

two months, and there's a "misunderstanding" on the part of the customer. Again, officials say the lag is due to quality assurance and the addition of new features to the software.

"We are pretty swift at releasing the software on the back of the hardware," says Nigel Oakley, a vice president in 3Com's network systems business unit. A new release of 3Com's Transcend software for Version 3.0 of the CoreBuilder 9000 will ship five weeks after release of Version 3.0, 3Com officials say.

Management issues aside, the Home Shopping Network (HSN) would like 3Com to focus on building more redundancy into its products. 3Com prides itself on the "PBX-like" redundancy of products such as its CoreBuilder 9000 data center switch, but HSN wants the company to go a bit further.

"Inside the box they built a nice, reliable box, but I can only put one line out" to another switch, says Roderick White, vice president of telecommunications for the St. Petersburg, Fla., television retailer. "That line becomes a

point of failure. I'd like to be able to double up everything all the way through and have it smart enough so that if this link goes down it'll pick up and travel over this one."

White also hopes 3Com learns how to integrate acquired companies and products faster. He has run into snags trying to get assistance on the NBX network PBX, which 3Com acquired earlier this year.

"I would have thought they would have learned when they took over US Robotics that if they buy somebody, they've got to integrate them in quickly," White says. "If I call for help on NBX I can't deal with my account rep. It's 'Well, you've got to go to the NBX guy,' who has his chain [of command]."

3Com officials say they integrated NBX manufacturing and sales into the company two months after they acquired it last June. The NBX dealer that was working with HSN, though, had not yet been folded into 3Com and was not privy to the intricacies of HSN's 3Com network, they say. ■

PictureTel looks to refocus

BY JASON MESERVE

ANAHEIM, CALIF. — Once synonymous with videoconferencing, PictureTel is looking to regain its form after a string of missteps that led to customer and shareholder dissatisfaction.

In September, former CEO Norman Gaut came out of retirement to retake the PictureTel reins in hopes of turning the company's fortune around, replacing CEO Bruce Bond.

At last week's TeleCon West 99 show, Gaut said the company's failure to execute a product and services strategy helped lead to his return after being away from the company for 18 months.

"The board felt it was most logical for me to fill in that part of the business," he says.

Gaut says his top three priorities are to create a clear company strategy, reduce expenses and "create a product path for creating world-class products, as we've done in the past."

In the two months since he's been back at the wheel, Gaut has taken a number of steps to help right the PictureTel ship.

For example, the company, located in North Andover, Mass., is currently looking for a buyer for its wholly-owned subsidiary, Multilink. Gaut believes Multilink's audio conferencing technology is not central to PictureTel's focus on videoconferencing and collaboration. The sale of Multilink would also provide much-needed capital that, along with a healthier

stock price, could allow the company to expand deeper into the Internet arena.

One feature of Multilink seeks to assist companies in centralizing the management of their multimedia collaboration applications. PictureTel plans to roll out the eVideo 3000, a rack-based system that will hold streaming servers, bridges for ISDN and IP data, and tools to control bandwidth in one location. The eVideo 3000 also features a Web portal that lets end users schedule conferences, store addresses and connect to other users

without having to know what type of system the other party is on.

Due out at year end, the rack will be custom-built using Compaq or Hewlett-Packard hardware, depending on customer needs.

"We'll be able to mix [connection] speeds, networks, and algorithms, and provide a gateway

from one type to another [such as ISDN to IP]," Gaut says.

Customers can choose to bring the eVideo rack in-house or have it hosted at a PictureTel network operations center. Pricing starts at \$250,000.

PictureTel is also upgrading its SwiftSite, a group videoconferencing product, in hopes of better competing with market leader Polycom and that firm's ViewStation product line. The enhanced SwiftSite features the Windows CE operating system and T.120 protocol for data collaboration.

PictureTel: www.picturetel.com



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IBM,
continued from page 19

vidual pieces at list price. The server can be accessed with Windows NT clients and can test the most demanding enterprise resource planning appli-

cations, IBM says.

This is good news for companies that have wanted to port their applications to the Internet but hesitated because they feared tying up or crashing their active mainframes, says Paul Naumann, vice president of Century Solutions, a

Baltimore IT consulting firm. Additionally, the ADS package will take days, if not weeks, off the time required to buy a mainframe and choose the correct software for application porting and testing, he says.

With ADS, in-house PC Windows or

Java developers don't necessarily need to have any expertise with COBOL or other legacy code to give the legacy applications a Web interface, Naumann says. "If it's done correctly, developers will be able to hook into the legacy rules without knowing what the underlying COBOL looks like," he says.

And IT executives don't have to worry about jeopardizing the applications or data when running an untested program on an online mainframe.

Companies looking to check their Y2K readiness also may want to consider this offering.

Naumann's firm plans to buy one mainframe immediately for its developers to work on over the company network and remotely over the Internet. The developers will be writing code for Century's mainframe clients, he says.

The ADS package is part of IBM's strategy to make the S/390 a more versatile server than it was when it only ran MVS and SNA for back-office applications, says Jonathan Eunice, analyst with Illuminata, a consultancy in Nashua, N.H. Users will get a quick, easy way to tinker with their Big Iron application — hopefully making the mainframe a more attractive competitor for e-commerce vs. the NT or Unix platforms, he says.

IBM has offered developer workstations before, but the boxes couldn't handle large-scale testing, and code development was seen as painstaking, Eunice says. There was also little room for low-cost testing.

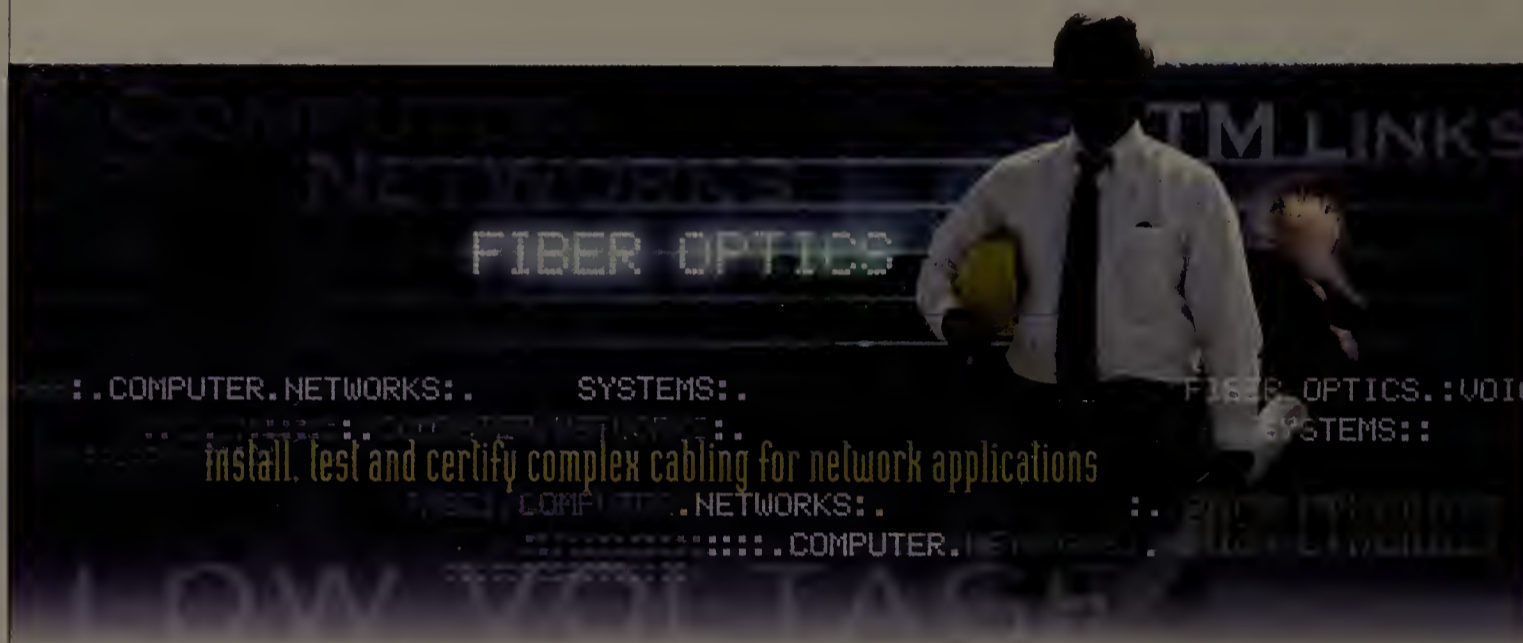
But this offering "really does offer the kind of environment required for stress testing," he says.

The ADS package includes the Visual Age Generator development kit; MQSeries, IBM's applications messaging product; the DB2 universal database; Tivoli's TME 10 NetView for network management; CICS Transaction Server; and more than a dozen S/390 software development products.

ADS will be available Nov. 26. The software costs \$8,500 per month over a 24-month lease. The S/390 Multiprise 3000 can be leased for \$9,000 per month or purchased for \$170,000.

IBM: www.S390.ibm.com/ads

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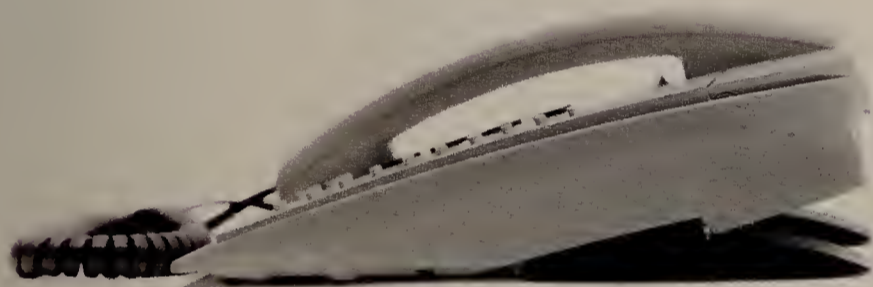
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Motorola beefs up branch-office router family

BY TIM GREENE

MANSFIELD, MASS. — Motorola will put more guts into two of its branch-office routers and wheel out a battery of new interface cards designed to make it easier for customers to upgrade the devices as their networks grow.

Specifically, the company is announcing Vanguard 6435 and 6455 modular routers, which process packets at three times the speed of the earlier Vanguard 6425, 6430 and 6450 models. The boxes sit in remote corporate locations, connecting LANs to dial-up or dedicated wide-area links.

Karen Prichard, a Motorola product line manager, says the company will announce three new cards for the routers: a 100M bit/sec Ethernet card, an ATM card, and an asymmetric DSL (ADSL) card. The cards can be easily swapped to let customers migrate to higher-speed LANs and faster wide-area connections without having to buy



Motorola's Vanguard improvements include two more powerful routers along with feature-filled ATM, ADSL and Ethernet boards.

new routers.

The two new boxes are aimed at small, remote offices and regional offices, and seem designed to compete with the Cisco 2500 series of routers, says Erin Dunn, an analyst with Vertical Systems Group in Dedham, Mass. She notes that the routers will not support symmetric DSL, the flavor of DSL typically used by businesses. "Branch offices

do not do ADSL," Dunn says.

The 6435 and 6455 routers include a motherboard upgrade that triples the throughput of existing Motorola devices from 5,000 packet/sec to 15,000 packet/sec. There is no formal program to upgrade existing Vanguard 6425, 6430 and 6450 routers by installing a new motherboard, Prichard says.

The new interface cards come in two types: option cards and daughtercards. Both the 6435 and 6455 have three slots to hold daughtercards. The 6455 features two additional larger slots for option cards. Because the slots are bigger, they can contain more ports than the daughtercards. The number of ports varies depending on the function of the card. Both routers handle IP, IPX and AppleTalk, among other protocols.

Cards that fit the older versions of these two routers also work in the 6435 and 6455, Prichard says. Those hardware modules support a variety of

interfaces, including serial connections, T-1, ISDN, DSU, voice, voice over IP and voice over frame relay.

The beefed-up motherboards also include processing power to perform 4:1 hardware compression of typical data traffic as well as Data Encryption Standard (DES) and Triple DES encryption.

Base models of the two new routers come with IP routing software and two serial ports. The Vanguard 6435 base model costs \$2,500, and the 6455 costs \$3,530. Cards range in price from \$200 to \$1,000. All will be available Nov. 30.

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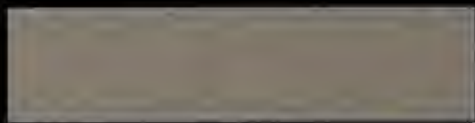
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Internetworking Monitor . Kevin Tolly

MEANINGFUL BENCHMARKING NEEDED AT LAYER 4+

Life was simple at Layer 3. Because the IP routing function is so straightforward, benchmarking the performance of Layer 3 LAN switches

engendered little confusion. But those days are over. With the arrival of Layer 4+ switches, benchmarking will never be the same.

As we climb up to Layer 4 and beyond — and deal with almost “layer-less” devices such as the cache — we need to realize that we are evaluating

services rather than just layers of software. Significant work is required industrywide to develop meaningful benchmarks.

Truth be told, what we leave behind leaves plenty of room for improvement. The de facto standard goal of achieving wire-speed throughput with minimal-size (i.e., 64-byte) packets has no basis in reality. Why is it important, really? Well, it isn't — really. It simply serves as a theoretical maximum performance point.

But is that where we want to go with Layer 4 and up — simply establishing a theoretical maximum (packet or session) rate as a goal and blindly marching toward it? I think not. Where Layer 2 and 3 devices dealt with the packet as the integral unit, Layer 4+ devices see a bigger picture — often one that cannot be benchmarked accurately by just counting packets.

Now that it's time for new benchmarks, let's not just run numbers for the sake of numbers — or run tests just because they can be run. Let's make certain that benchmarks are meaningful. And the best way to do that is to work backwards.

The ideal benchmark development process should start at the end by understanding the specific capability that is to be benchmarked. For example, one benchmark might quantify how many sessions per second can be distributed among a set of back-end servers, while a very different one might be used to judge the sensitivity of the switch to the prevailing loads on those boxes. Both benchmarks add to our understanding of the solution set.

As we begin to build these next-generation tests, I believe that we have to embrace a set of guidelines to make sure that benchmarks are not misused and do not detract from our understanding of the leading-edge technology we hope to deploy. Here are some requirements I'd like to propose as the basis for next-generation benchmarks:

- Precise definition of purpose.
- Clear explanation of why the benchmark is meaningful.
- Delineation of what capabilities the benchmark exercises — and those it does not.
- Clear mapping of results to real-world scenarios.

Of the four, the last is the most important. It says: “Prove to us that n-thousand sessions per second is relevant to our environment.”

Early next month, we'll be meeting with many of the people responsible for developing and espousing benchmarks. Send me your thoughts so I can share them with others at the meeting.

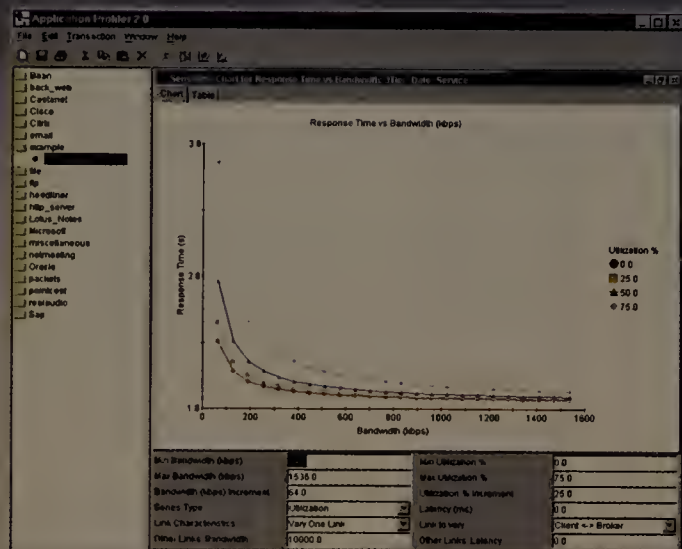
Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (723) 528-3300 or ktolly@tolly.com.

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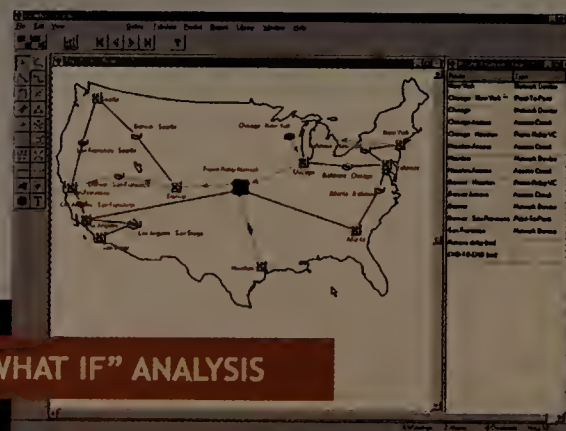


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Briefs

AT&T has accelerated its OC-192 IP backbone upgrade and plans to support Internet traffic over the 10G bit/sec portion of its network by the end of the month. AT&T originally said it wouldn't have OC-192 in its network until the first half of next year. But the service provider says it changed its timetable due to customer demand. AT&T's link between Cambridge, Mass., and New York is the first slated to get the 10G bit/sec upgrade, with the rest of the network scheduled to come online next year.

AT&T: www.att.com

Bell Atlantic Mobile this week will start offering Web access via mobile phone for about \$10 per month in addition to its regular wireless phone fee. The service, called Web Access, will include digital wireless phones with built-in modems that enable customers to surf the Web, send and receive e-mail, and set up customized Web pages. It includes access to more than 20 content providers, such as business, travel, weather and financial sites.

Bell Atlantic: www.bellatlantic.com

St. Louis-based **Catalyst Solutions Group**, an ISP and consulting firm, has changed its name to **Connectria** as part of the company's expansion into the application service provider market. As an ASP, Connectria provides hosting services for custom software and commercial products, such as Lotus Notes and Lotus LearningSpace. Connectria recently contracted with Lotus to deliver that company's LearningSpace Anytime 3.0 distance learning and QuickPlace collaboration offerings over the Internet.

Connectria: www.connectria.com

User groups criticize caller-paid wireless

BY DAVID ROHDE

WASHINGTON, D.C. — Two telecom user groups are raising alarms about a government proposal that would let wireless carriers provide a calling-party-pays (CPP) option to subscribers.

The groups — one for very large enterprises and one for network managers at colleges and universities — are warning the Federal Communications Commission that schools and corporations could get socked with billions of dollars in extra toll charges if wireless carriers implement CPP.

In a filing at the FCC, the groups say the FCC's proposal to implement and then regulate CPP — by requiring an automated announcement to the caller that he or she has reached a mobile phone subscriber who has chosen the CPP option — isn't good enough. That's because many employees, students and visitors who place calls through PBX systems won't have any incentive to hang up rather than continue the call, figuring the corporation or university will pay the bill.

The groups' proposed solution: Require all mobile phone numbers for CPP subscribers to be placed in distinct area codes. That way, PBXs can block calls to those area codes for all but

acronym ACUTA, though it recently dropped the original meaning of those letters — the Association of College and University Telecom Administrators — and now dubs itself "the association of

The cost of a policy change

Industry analysts and officials say the total cost of calling-party pays (CPP) charges to organizations could be \$3 billion to \$7 billion per year, based on:

- An average nationwide wireless rate of 28 cents per minute.
- Wireless call volume of 118.8 billion minutes per year.
- An assumption that CPP will account for 10% to 20% of calls.

SOURCES: CELLULAR TELECOMMUNICATIONS INDUSTRY ASSOCIATION, FCC, AD HOC TELECOMMUNICATIONS USERS COMMITTEE

select end users. PBXs generally use area codes to make routing decisions to carriers and to determine whether a call is permissible.

One of the two groups is the Ad Hoc Telecommunications Users Committee, a collection of 18 large corporations that occasionally comments on telecom regulations. The other is a long-standing educational group that goes by the

telecommunications professionals in higher education."

The two groups' joint Washington-based attorney, Kevin DiLallo, says the area-code proposal wouldn't really inconvenience end users. It's common for enterprises to require end users to enter a special account code or use a calling card to place a call that will result in a

See **Wireless**, page 34

Consortium leader maps shifting ASP landscape

Fledgling organization focusing on industry development this year, end users next.



The ASP Consortium kicked off in March and now has some 200 members. Conceived by ven-

dors, the group has been trying to develop a series of guidelines and best practices. Next year, the group intends to focus on end users.

Network World Senior Editor John Fontana recently spoke with consortium Chairman Traver Gruen-Kennedy at the ASP Summit in Denver.

There are lots of definitions of "ASP." How do you define it?

Basically, it's a one-to-many model in which one ASP provides services to many different customers. That would obviate an internal IT organization being an application service provider to its

internal users. It's from a data center across a WAN, so it is not across a LAN.

What efforts will the consortium make toward end-user education, not only in terms of hosted applications, but security and bandwidth?

Research is being done in our committees, and we will post that when it becomes available. I think that our focus, as we move from this year to next, will switch from being industry-development-focused to being more customer-centric. There is a lot of stuff that needs to be gone through. But people are smart; they can figure out what is real and not real. We can help to provide added evidence so that hopefully mistakes and bad choices can be avoided.

Do you hope to add some sort of an end-user committee to the consortium?

We are interested in adding any committee that our members think is appropriate.

There are several different business models for ASPs. How do customers determine what models are best for them or that one model is better than the others?

Right now what we see is that users have two key concerns. One is whether an application is going to be available in a secure environment every time. And the other is if their ASPs are going to be around tomorrow. Our goals are to not only help educate the marketplace but also to educate ASPs themselves to help create some standards and guidelines for the industry.

When will those be forthcoming?

We committed to deliver some information. See **ASP**, page 34



Wireless,
continued from page 33

toll. And unlike wireline calls, virtually all wireless calls — local or long-distance — generate a toll, though currently the toll is almost always charged to the wireless handset owner, he says.

That's more important than allowing a situation to develop in which an enterprise or university is fighting with its own end users over who will pay for a call. Employees or students who accept a CPP toll call on the corporate system aren't necessarily being dishonest, he says; it's just that "human nature

being what it is, sometimes people just don't care."

But the Ad Hoc Telecommunications Users Committee/ACUTA area-code proposal is generally opposed by the wireless industry, which has repeatedly fought the idea of segregating wireless technology into separate area codes. In

their own comments, wireless trade groups have complained that they would have to reprogram potentially millions of wireless handsets for new CPP area codes.

DiLallo dismisses this concern. "While such reprogramming might in the past have required an on-site visit by the customer, modern digital handsets can be reprogrammed remotely, or certainly through a brief telephone contact with a service representative who can walk the customer through the reprogramming keystrokes," he says in the groups' comment letter.

The FCC proposed CPP as an optional national wireless service last June but is not expected to make a final ruling until next year. ■

ASP,
continued from page 33

mation by the end of this year. Because our dues are steep — \$15,000 per year — we have raised a fair amount of money, so we are totally prepared to underwrite research. In the first half of next year, we would like to develop a series of case studies, customer stories and how best practices were delivered in various aspects of an ASP delivery mechanism.

Most users are not using the Internet to access hosted applications. Why is that and will it change over time?

One of the common misconceptions is that this is all Internet-based. Most of the ASPs, while they use Web technologies, are not using the Internet as the delivery mechanism. The reason they are not is that there are no security guarantees, no performance guarantees, and most ASPs today are making some service-level guarantee. That will change. First of all, the Internet-based technologies are being improved. Being able to manage from the routing layer to the application layer is something we are already beginning to see.

There are a variety of clients available: fat clients, Web clients, thin clients. What's the most popular client for ASP members?

There are several different architectures, but ASPs primarily are using two today. One is the standard browser download applet model for managing that applet on the desktop once it is there. Then there is the thin-client server-based model, which is also widely used. ASPs like it because it allows them to get economies of scale and allows them to manage users end to end. I am seeing some interest in moving to the thin-client model for e-commerce applications, particularly business-to-consumer applications because you don't have to care what the connection is. ■

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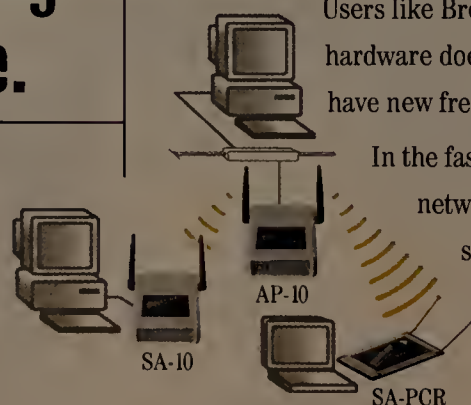
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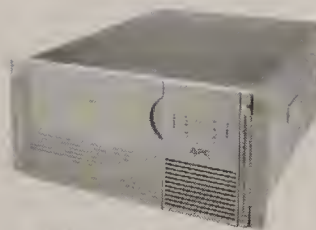


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City/Town: _____ State: _____ Zip: _____ Country: _____
Phone: _____
Brand of UPS used? _____ # _____
Brand of PC used? _____ # _____
Brand of Servers used? _____ # _____

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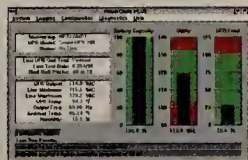
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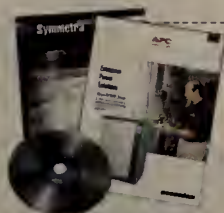
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Sycamore aims to chop optical network costs

BY TIM GREENE

CHELMSFORD, MASS. — Optical networking specialist Sycamore

Networks is introducing hardware that makes it less expensive for carriers to deliver optical services at speeds as low as 155M bit/sec.

New cards for Sycamore's SN8000 Intelligent Optical Network Node let carriers break down optical bandwidth to below the OC-48 level,

which is the capacity of a full wavelength of light on an optical fiber.

Before, if a customer wanted to buy a 155M bit/sec optical service, the provider would have to waste 2.3G bit/sec of additional bandwidth on a full wavelength of light on a fiber. Provisioning such a service would cost \$250,000.

Otherwise, the carrier would have to install a separate and expensive SONET multiplexer between the customer site and the wave division multiplexing gear in the carrier backbone. The mux would take in the customer's OC-3 and multiplex it with other traffic that would go on the same light wavelength. This configuration would cost \$18,000 per OC-3.

New card features

The new cards incorporate the SONET muxing capability of a separate multiplexer for about \$5,000 per OC-3. The cards come in four- or 16-port versions. Any port can be configured as an OC-3 or OC-12. The SONET muxing occurs within the card, and the muxed traffic leaves the SN8000 via a separate OC-48 card in the chassis.

Sycamore is also introducing cards that transform the SN8000 from a metropolitan-area network, short-haul box into a long-haul backbone device. With the new minicards that fit on existing SN8000 cards, the device can transmit traffic for up to 1,600 kilometers without the need to regenerate the light signal.

The minicards add processing power to make the light signal travel farther without dispersing to the point that it can no longer be understood. The card uses technology called optical gain equalization.

As part of the long-haul hardware, Sycamore also makes an optical amplifier that has to be placed on the fiber every 80 to 100 kilometers.

Directly battling Sycamore in this area will be fellow start-up Qtera, which claims it is also developing optical gear that delivers similar long-distance capabilities (NW, Oct. 18, page 33).

Beta tests will be completed by the end of the first quarter of 2000.

Sycamore: www.sycamorenet.com



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- **Serviceable while load is up and running** – Additional battery modules increase runtime and all the modules are hot swappable, meaning no downtime.



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PowerView™ is a hand-held control panel for network administrators that configures and controls UPSs in rack, computer room, and datacenter environments.



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"Not having a Symmetra in place would have resulted in lost data, corrupted hard drives and lost time to recover. The Symmetra system has more than paid for itself during this one outage."

- Bob Lesher and Charlie Bise, Information Technology, Exel Logistics

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Eye on the carriers . David Rohde

QWEST'S SERVICE PROBLEMS NO GREAT MYSTERY

Folks in the carrier industry like to live life the hard way, and Qwest — the new national carrier that lately has been struggling to meet users'

installation dates — is no exception.

When Qwest burst onto the scene two years ago, it seemed to have a well-defined mission. Jeff Crowder, a project

director at Virginia Tech University, recalls hearing a Qwest official at the time promise the carrier would concentrate on high-capacity data trans-

port with free voice as a possible add-on. The Qwest official then added: "If we ever go out and sell circuit-switched voice, somebody please shoot me."

But in mid-1998, Qwest contradicted itself and bought long-distance carrier LCI International, which owned traditional Nortel Networks DMS telephony central office switches and some older Newbridge packet data switches.

Qwest eventually replaced the Newbridge equipment with an Ascend (now Lucent) frame relay/ATM net — and installed Cisco's gigabit switch routers to anchor its ultra-high-speed IP network. But when Qwest took advantage of the WorldCom/MCI merger by stealing away a boatload of MCI salespeople, it told them to feel free to go out and sell what they knew best, including circuit-switched voice and T-1s.

As if that weren't enough, Qwest earlier this year won the bidding to buy US West — a regional Bell operating company — completing its transition to a carrier for all seasons. And in the eyes of regulators, the US West acquisition will make Qwest not just the owner of an RBOC, but an RBOC itself, subject to all the regulatory rigmarole that a Bell company has to deal with.

Qwest CEO Joe Nacchio deserves credit for recognizing that enterprise users need an additional national option — made more clear after the MCI WorldCom/Sprint deal — and that fulfilling that need depends on more than just one kind of service or another.

But here's an ironic footnote in Qwest's headlong rush into providing a full range of telecom services:

On Nov. 4, I was due to speak to Nacchio as a follow-up to my conversations with other Qwest officials as we prepared our story about Qwest's operational problems. At the last minute, Nacchio was called away to an urgent meeting about US West's planned long-distance applications with regulators. It so happens that at that very hour, MCI WorldCom CEO Bernie Ebbers and Sprint CEO Bill Esrey were appearing before the Senate Judiciary Committee to justify their merger. I don't know what AT&T CEO Mike Armstrong was doing that morning, but he's spent an awful lot of time recently on the political ramifications of his acquisitions of cable companies.

So there you have it:

The heads of the three companies that may become your biggest choices for comprehensive voice and data contracts — AT&T, Qwest, and WorldCom — all out appealing politicians rather than concentrating on making sure you get great, innovative services. No wonder underlings at the carriers are constantly huffing and puffing to keep up with service promises!

Robde is a senior editor with Network World. He can be reached at drobde@nuw.com.



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1. What is the principal business activity at your location? (check ONE only)

01. <input type="checkbox"/> Manufacturing (other)	10. <input type="checkbox"/> Education	19. <input type="checkbox"/> Systems/Network Integrators*
02. <input type="checkbox"/> Finance/Banking	11. <input type="checkbox"/> Government	20. <input type="checkbox"/> Distributors (Computer/Communications)*
03. <input type="checkbox"/> Insurance/Real Estate/Legal	12. <input type="checkbox"/> Military	21. <input type="checkbox"/> Other (please specify) _____
04. <input type="checkbox"/> Health Care Services	13. <input type="checkbox"/> Aerospace	
05. <input type="checkbox"/> Hospitality/Entertainment/Recreation	14. <input type="checkbox"/> Consulting (Independent) *	
06. <input type="checkbox"/> Media/TV/Cable/Radio/Print	15. <input type="checkbox"/> Carriers/Service Providers	
07. <input type="checkbox"/> Retail/Wholesale Trade/Business Services	16. <input type="checkbox"/> Internet Service Provider (ISP)	
08. <input type="checkbox"/> Transportation	17. <input type="checkbox"/> Manufacturing (Computer/Communications/OEM)	
09. <input type="checkbox"/> Utilities/Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)	18. <input type="checkbox"/> Resellers of Computer/Network Products (VARs,VADs)*	

*Attn Consultants, Integrators, Distributors, Resellers: Please complete entire form based on ALL clients and your own business needs

2. P: What is your primary job function? (check ONE only)
S: What is your secondary job function? (check ALL that apply)

P	S	P	S	P	S
<input type="checkbox"/> 1. <input type="checkbox"/> Network Management	<input type="checkbox"/> 5. <input type="checkbox"/> Internet/Intranet/e-Commerce Mgmt, Webmaster	<input type="checkbox"/> 7. <input type="checkbox"/> Corporate Management (CEO, COO, CFO, Pres., VP, Dir., Mgr.)		<input type="checkbox"/> 8. <input type="checkbox"/> Consultant (Independent)	
<input type="checkbox"/> 2. <input type="checkbox"/> LAN Management	<input type="checkbox"/> 6. <input type="checkbox"/> Engineering Management	<input type="checkbox"/> 9. <input type="checkbox"/> Other (please specify) _____			
<input type="checkbox"/> 3. <input type="checkbox"/> Datacom/Telecom Management					
<input type="checkbox"/> 4. <input type="checkbox"/> IS/IT/MIS/CIO/CTO/Systems Management					

3. What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code on the line next to each product category. Please complete ALL categories A-N.)

1. \$100 Million or more	A _____	Large Systems (Mainframes/Minis)	G _____	Internetworking
2. \$50 Million to \$99.9 Million			H _____	Internet
3. \$25 Million to \$49.9 Million	B _____	Desktops (Micros/Laptops/Workstations/PDAs)	I _____	Intranet
4. \$10 Million to \$24.9 Million			J _____	Extranet/Ecommerce
5. \$1 Million to \$9.9 Million	C _____	Servers	K _____	Remote Access
6. \$100,000 to \$999,999	D _____	LANs	L _____	Peripherals (including storage)
7. \$50,000 to \$99,999	E _____	WAN Equipment	M _____	Software
8. Under \$50,000	F _____	Carrier Services	N _____	Service/Support
9. None of the above				

4. What is the total number of sites for which you have purchase influence? (check ONE only)

1. <input type="checkbox"/> 100+	2. <input type="checkbox"/> 50 - 99	3. <input type="checkbox"/> 20 - 49	4. <input type="checkbox"/> 10 - 19	5. <input type="checkbox"/> 2 - 9	6. <input type="checkbox"/> 1	7. <input type="checkbox"/> None
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5. What is the total number of Servers/Clients/LANs installed/planned at your location/ in your entire organization? (check ONE box in each column)

SERVERS		CLIENTS		LANs	
At Location	Entire Org.	At Location	Entire Org.	At Location	Entire Org.
A	B	C	D	E	F
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>
<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>
<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>
<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check ONE only) CORPORATE: 1. <input type="checkbox"/> Entire Enterprise/Multiple Enterprises 2. <input type="checkbox"/> Division/Multiple Divisions 3. <input type="checkbox"/> Department 4. <input type="checkbox"/> None	B. Involvement (check ALL that apply) 1. <input type="checkbox"/> Create Network/IT Strategy 2. <input type="checkbox"/> Recommend/Specify Brand 3. <input type="checkbox"/> Approve Purchase 4. <input type="checkbox"/> Evaluate Products/Services 5. <input type="checkbox"/> Determine the Need 6. <input type="checkbox"/> None
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

7. What is the estimated number of employees at your location/in entire organization? (check ONE in each section)

A. At your location: 1. <input type="checkbox"/> Over 20,000 2. <input type="checkbox"/> 10,000 - 19,999 3. <input type="checkbox"/> 5,000 - 9,999 4. <input type="checkbox"/> 2,500 - 4,999 5. <input type="checkbox"/> 1,000 - 2,499	B. Entire organization: 1. <input type="checkbox"/> Over 20,000 2. <input type="checkbox"/> 10,000 - 19,999 3. <input type="checkbox"/> 5,000 - 9,999 4. <input type="checkbox"/> 2,500 - 4,999	5. <input type="checkbox"/> 1,000 - 2,499 6. <input type="checkbox"/> 500 - 999 7. <input type="checkbox"/> 100 - 249 8. <input type="checkbox"/> 99 or less 9. <input type="checkbox"/> 1,000 - 2,499
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8. Please indicate the Internet/Intranet/LAN/WAN products/services that you are currently involved in purchasing or plan to purchase (check ALL that apply)

A. Currently Involved in purchasing		B. Plan to purchase	
INTERNET/INTRANET			
A	B	A	B
<input type="checkbox"/> 01. <input type="checkbox"/> VPN Equipment	<input type="checkbox"/> 07. <input type="checkbox"/> Voice/Video Over IP (IP Multicast Routing)	<input type="checkbox"/> 12. <input type="checkbox"/> Management/Monitoring Software	<input type="checkbox"/>
<input type="checkbox"/> 02. <input type="checkbox"/> VPN Services	<input type="checkbox"/> 08. <input type="checkbox"/> Internet Services	<input type="checkbox"/> 13. <input type="checkbox"/> Web Based Management Tools	<input type="checkbox"/>
<input type="checkbox"/> 03. <input type="checkbox"/> Firewalls/Security/Encryption	<input type="checkbox"/> 09. <input type="checkbox"/> Web Hosting	<input type="checkbox"/> 14. <input type="checkbox"/> Web Based Collaboration/Groupware	<input type="checkbox"/>
<input type="checkbox"/> 04. <input type="checkbox"/> Electronic Commerce	<input type="checkbox"/> 10. <input type="checkbox"/> Host Access	<input type="checkbox"/> 15. <input type="checkbox"/> Caching/Load Balancing Products	<input type="checkbox"/>
<input type="checkbox"/> 05. <input type="checkbox"/> Web Servers/Software	<input type="checkbox"/> 11. <input type="checkbox"/> Web Development Tools	<input type="checkbox"/> 16. <input type="checkbox"/> Other Internet/Intranet	<input type="checkbox"/>
<input type="checkbox"/> 06. <input type="checkbox"/> Web Enabled Call Center Tools			
LOCAL-AREA NETWORKS/INTERNETWORKING			
A	B	A	B
<input type="checkbox"/> 17. <input type="checkbox"/> Local-Area Networks	<input type="checkbox"/> 25. <input type="checkbox"/> Layer 2 Switches	<input type="checkbox"/> 33. <input type="checkbox"/> UPS	<input type="checkbox"/>
<input type="checkbox"/> 18. <input type="checkbox"/> Network Operating System Software (NOS)	<input type="checkbox"/> 26. <input type="checkbox"/> Layer 3 Switches	<input type="checkbox"/> 34. <input type="checkbox"/> Network Interface Cards (NICs,PCMCIA)	<input type="checkbox"/>
<input type="checkbox"/> 19. <input type="checkbox"/> Intel Based Servers	<input type="checkbox"/> 27. <input type="checkbox"/> Layer 4 Switches	<input type="checkbox"/> 35. <input type="checkbox"/> Hubs/Intelligent Hubs/Stackable Hubs	<input type="checkbox"/>
<input type="checkbox"/> 20. <input type="checkbox"/> Intel Based Multiprocessor Servers	<input type="checkbox"/> 28. <input type="checkbox"/> ATM Switches	<input type="checkbox"/> 36. <input type="checkbox"/> Cables,Connectors, Baluns	<input type="checkbox"/>
<input type="checkbox"/> 21. <input type="checkbox"/> RISC Based Servers	<input type="checkbox"/> 29. <input type="checkbox"/> Token-Ring Switches	<input type="checkbox"/> 37. <input type="checkbox"/> SNMP Platform	<input type="checkbox"/>
<input type="checkbox"/> 22. <input type="checkbox"/> Clustered Servers	<input type="checkbox"/> 30. <input type="checkbox"/> Network Storage (NAS, SANs)	<input type="checkbox"/> 38. <input type="checkbox"/> Management Frameworks	<input type="checkbox"/>
<input type="checkbox"/> 23. <input type="checkbox"/> Print Servers	<input type="checkbox"/> 31. <input type="checkbox"/> Storage/Backup (Optical, Disk, Tape, RAID)	<input type="checkbox"/> 39. <input type="checkbox"/> Other LAN/Internetworking	<input type="checkbox"/>
<input type="checkbox"/> 24. <input type="checkbox"/> Routers	<input type="checkbox"/> 32. <input type="checkbox"/> Network Test/Diagnostic Tools		
WAN EQUIPMENT & SERVICES			
A	B	A	B
<input type="checkbox"/> 40. <input type="checkbox"/> Modems	<input type="checkbox"/> 46. <input type="checkbox"/> Remote Access Services	<input type="checkbox"/> 53. <input type="checkbox"/> PBXs	<input type="checkbox"/>
<input type="checkbox"/> 41. <input type="checkbox"/> Cable Modems	<input type="checkbox"/> 47. <input type="checkbox"/> Wireless Data Equipment/Services	<input type="checkbox"/> 54. <input type="checkbox"/> Videoconferencing	<input type="checkbox"/>
<input type="checkbox"/> 42. <input type="checkbox"/> Asynchronous Transfer Mode (ATM)	<input type="checkbox"/> 48. <input type="checkbox"/> ISDN Equipment/Services	<input type="checkbox"/> 55. <input type="checkbox"/> Managed LAN/Router Services	<input type="checkbox"/>
<input type="checkbox"/> 43. <input type="checkbox"/> Frame Relay Equipment Including FRADS	<input type="checkbox"/> 49. <input type="checkbox"/> FT-1/T-1/T-3 Services	<input type="checkbox"/> 56. <input type="checkbox"/> Fax Servers/Services	<input type="checkbox"/>
<input type="checkbox"/> 44. <input type="checkbox"/> Frame Relay Services	<input type="checkbox"/> 50. <input type="checkbox"/> xDSL Services/Products	<input type="checkbox"/> 57. <input type="checkbox"/> Other WAN Equipment/Services	<input type="checkbox"/>
<input type="checkbox"/> 45. <input type="checkbox"/> Remote Access Products	<input type="checkbox"/> 51. <input type="checkbox"/> Diagnostic/Test Equipment		
	<input type="checkbox"/> 52. <input type="checkbox"/> DSU/CSU	None of the above (1 - 57)	<input type="checkbox"/> 58. <input type="checkbox"/>

9. Please indicate the Network hardware/software/services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)

A. Currently Involved in purchasing		B. Plan to purchase	
COMPUTERS/PERIPHERALS			
A	B	A	B
<input type="checkbox"/> 01. <input type="checkbox"/> Laptops/Notebooks/PDAs	<input type="checkbox"/> 05. <input type="checkbox"/> Storage/Backup (Optical,Disk,Tape,RAID)	<input type="checkbox"/> 08. <input type="checkbox"/> Minis	<input type="checkbox"/>
<input type="checkbox"/> 02. <input type="checkbox"/> PCs	<input type="checkbox"/> 06. <input type="checkbox"/> Printers	<input type="checkbox"/> 09. <input type="checkbox"/> Mainframes	<input type="checkbox"/>
<input type="checkbox"/> 03. <input type="checkbox"/> Windows Terminals/Thin Clients	<input type="checkbox"/> 07. <input type="checkbox"/> Printer/Fax/Copier Hybrids (Multifunction Printers)	<input type="checkbox"/> 10. <input type="checkbox"/> Fax/Modem Boards	<input type="checkbox"/>
<input type="checkbox"/> 04. <input type="checkbox"/> Workstations		<input type="checkbox"/> 11. <input type="checkbox"/> Memory/Chips/Boards/Cards	<input type="checkbox"/>
SOFTWARE/APPLICATIONS			
A	B	A	B
<input type="checkbox"/> 13. <input type="checkbox"/> Network Management	<input type="checkbox"/> 21. <input type="checkbox"/> E-Mail	<input type="checkbox"/> 28. <input type="checkbox"/> Site Metering Tools	<input type="checkbox"/>
<input type="checkbox"/> 14. <input type="checkbox"/> Systems Management	<input type="checkbox"/> 22. <input type="checkbox"/> Enterprise Resource Planning (ERP)	<input type="checkbox"/> 29. <input type="checkbox"/> Data Warehousing	<input type="checkbox"/>
<input type="checkbox"/> 15. <input type="checkbox"/> Security	<input type="checkbox"/> 23. <input type="checkbox"/> EDI	<input type="checkbox"/> 30. <input type="checkbox"/> Anti Virus Software	<input type="checkbox"/>
<input type="checkbox"/> 16. <input type="checkbox"/> Directory Services	<input type="checkbox"/> 24. <input type="checkbox"/> Desktop Videoconferencing	<input type="checkbox"/> 31. <input type="checkbox"/> Multimedia	<input type="checkbox"/>
<input type="checkbox"/> 17. <input type="checkbox"/> Operating Systems	<input type="checkbox"/> 25. <input type="checkbox"/> Imaging	<input type="checkbox"/> 32. <input type="checkbox"/> Y2K Conversion Software	<input type="checkbox"/>
<input type="checkbox"/> 18. <input type="checkbox"/> Applications Development Tools	<input type="checkbox"/> 26. <input type="checkbox"/> Middleware/Serverware	<input type="checkbox"/> 33. <input type="checkbox"/> Helpdesk	<input type="checkbox"/>
<input type="checkbox"/> 19. <input type="checkbox"/> Database Management/RDBMS	<input type="checkbox"/> 27. <input type="checkbox"/> Document Management	<input type="checkbox"/> 34. <input type="checkbox"/> Other Software/Applications	<input type="checkbox"/>
<input type="checkbox"/> 20. <input type="checkbox"/> Groupware			
SERVICES			
A	B	A	B
<input type="checkbox"/> 35. <input type="checkbox"/> BPO (Business Process Outsourcing incl. Financial Services, HR, Logistics etc.)	<input type="checkbox"/> 36. <input type="checkbox"/> Applications Outsourcing	<input type="checkbox"/> 39. <input type="checkbox"/> Education/Training Services	<input type="checkbox"/>
	<input type="checkbox"/> 37. <input type="checkbox"/> Call Center Outsourcing	<input type="checkbox"/> 40. <input type="checkbox"/> Other Services	<input type="checkbox"/>
	<input type="checkbox"/> 38. <input type="checkbox"/> Systems Integration/Consulting	None of the above (1 - 40)	<input type="checkbox"/> 41. <input type="checkbox"/>

10. Please indicate the platforms that are currently installed/planned: (check ALL that apply)

A. Currently Installed		B. Planned for purchase	
NETWORK PROTOCOLS			
A	B	A	B
<input type="checkbox"/> 01. <input type="checkbox"/> TCP/IP	<input type="checkbox"/> 04. <input type="checkbox"/> Novell IPX/SPX	<input type="checkbox"/> 07. <input type="checkbox"/> NFS	<input type="checkbox"/>
<input type="checkbox"/> 02. <input type="checkbox"/> IPv6	<input type="checkbox"/> 05. <input type="checkbox"/> APPC/APPN/LU 6.2	<input type="checkbox"/> 08. <input type="checkbox"/> SNMP	<input type="checkbox"/>
<input type="checkbox"/> 03. <input type="checkbox"/> SNA	<input type="checkbox"/> 06. <input type="checkbox"/> NETBIOS/NETBUEI	<input type="checkbox"/> 09. <input type="checkbox"/> Other Network Protocols	<input type="checkbox"/>
LAN/WAN ENVIRONMENT			
A	B	A	B
<input type="checkbox"/> 10. <input type="checkbox"/> Gigabit Ethernet	<input type="checkbox"/> 16. <input type="checkbox"/> IP Switching	<input type="checkbox"/> 22. <input type="checkbox"/> Wireless	<input type="checkbox"/>
<input type="checkbox"/> 11. <input type="checkbox"/> Switched Ethernet	<input type="checkbox"/> 17. <input type="checkbox"/> Layer 3,4 Switching	<input type="checkbox"/> 23. <input type="checkbox"/> DSL	<input type="checkbox"/>
<input type="checkbox"/> 12. <input type="checkbox"/> Fast Ethernet	<input type="checkbox"/> 18. <input type="checkbox"/> FDDI	<input type="checkbox"/> 24. <input type="checkbox"/> ISDN	<input type="checkbox"/>
<input type="checkbox"/> 13. <input type="checkbox"/> Ethernet	<input type="checkbox"/> 19. <input type="checkbox"/> 100Base-T	<input type="checkbox"/> 25. <input type="checkbox"/> Frame Relay	<input type="checkbox"/>
<input type="checkbox"/> 14. <input type="checkbox"/> ATM	<input type="checkbox"/> 20. <input type="checkbox"/> 10Base-T	<input type="checkbox"/> 26. <input type="checkbox"/> Private Line T1, T3, FT-1, SONET	<input type="checkbox"/>
<input type="checkbox"/> 15. <input type="checkbox"/> Token Ring/Token Ring Switching	<input type="checkbox"/> 21. <input type="checkbox"/> Fibre Channel	<input type="checkbox"/> 27. <input type="checkbox"/> Other LAN/WAN Environment	<input type="checkbox"/>
NETWORK OPERATING SYSTEM			
A	B	A	B
<input type="checkbox"/> 28. <input type="checkbox"/> Windows NT/Windows 2000	<input type="checkbox"/> 32. <input type="checkbox"/> LINUX	<input type="checkbox"/> 35. <input type="checkbox"/> IBM (LAN Server)	<input type="checkbox"/>
<input type="checkbox"/> 29. <input type="checkbox"/> Novell (NetWare 5.X)	<input type="checkbox"/> 33. <input type="checkbox"/> Microsoft (LAN Manager)	<input type="checkbox"/> 36. <input type="checkbox"/> Other Network Operating System	<input type="checkbox"/>
<input type="checkbox"/> 30. <input type="checkbox"/> Novell (NetWare 4.X)	<input type="checkbox"/> 34. <input type="checkbox"/> Banyan (Vines)		
<input type="checkbox"/> 31. <input type="checkbox"/> Novell (NetWare 2.X,3.X)			
COMPUTER OPERATING SYSTEM			
A	B	A	B
<input type="checkbox"/> 37. <input type="checkbox"/> NT Workstation	<input type="checkbox"/> 42. <input type="checkbox"/> LINUX	<input type="checkbox"/> 47. <input type="checkbox"/> Digital VMS	<input type="checkbox"/>
<input type="checkbox"/> 38. <input type="checkbox"/> Windows 2000	<input type="checkbox"/> 43. <input type="checkbox"/> DOS	<input type="checkbox"/> 48. <input type="checkbox"/> Macintosh	<input type="checkbox"/>
<input type="checkbox"/> 39. <input type="checkbox"/> Windows 98/95/3.1	<input type="checkbox"/> 44. <input type="checkbox"/> OS/2,OS/2 WARP	<input type="checkbox"/> 49. <input type="checkbox"/> Other Computer Operating System	<input type="checkbox"/>
<input type="checkbox"/> 40. <input type="checkbox"/> Intel based UNIX	<input type="checkbox"/> 45. <input type="checkbox"/> OS/400		
<input type="checkbox"/> 41. <input type="checkbox"/> RISC based UNIX (incl. SOLARIS)	<input type="checkbox"/> 46. <input type="checkbox"/> IBM MVS/VM/VSE/ESA	None of the above (1- 49)	<input type="checkbox"/> 50. <input type="checkbox"/>

11. Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Mainframes (Large Scale) 1. <input type="checkbox"/> IBM 2. <input type="checkbox"/> Other	B - Minis (Midrange) 1. <input type="checkbox"/> IBM RS/6000 2. <input type="checkbox"/> IBM AS/400 3. <input type="checkbox"/> Digital/Tandem/Compaq 4. <input type="checkbox"/> Unisys 5. <input type="checkbox"/> H-P 6. <input type="checkbox"/> Other	C - Workstations 1. <input type="checkbox"/> Sun Microsystems 2. <input type="checkbox"/> H-P 3. <input type="checkbox"/> Digital/Compaq 4. <input type="checkbox"/> IBM 5. <input type="checkbox"/> Silicon Graphics 6. <input type="checkbox"/> Other
-------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

12. What is the estimated gross revenue of your entire company/institution? (check ONE only)

1. <input type="checkbox"/> \$20 Billion or More	5. <input type="checkbox"/> \$100 Million to \$499.9 Million	9. <input type="checkbox"/> \$4.9 Million or less
2. <input type="checkbox"/> \$10 Billion to \$19.9 Billion	6. <input type="checkbox"/> \$50 Million to \$99.9 Million	10. <input type="checkbox"/> None of the above
3. <input type="checkbox"/> \$1 Billion to \$9.9 Billion	7. <input type="checkbox"/> \$10 Million to \$49.9 Million	
4. <input type="checkbox"/> \$500 Million to \$999.9 Million	8. <input type="checkbox"/> \$5 Million to \$9.9 Million	

13. For which areas outside of the US do you have purchase influence? (check ALL that apply)

1. <input type="checkbox"/> Europe	3. <input type="checkbox"/> South America	5. <input type="checkbox"/> Middle East	7. <input type="checkbox"/> Canada
2. <input type="checkbox"/> Asia	4. <input type="checkbox"/> Australia	6. <input type="checkbox"/> Africa	8. <input type="checkbox"/> None

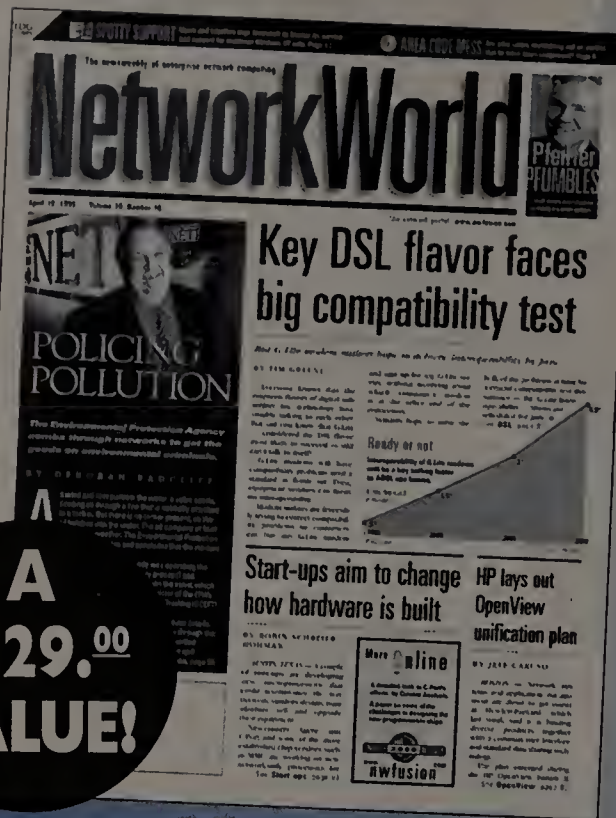
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Briefs

Oracle this week will release its XML Developer's Kit, a set of tools that programmers can use to build XML-based applications.

The tool kit, which costs \$195 with support and is free without support, will include a parser for writing XML documents in Java, C, C++ or PL/SQL. In addition, the tool kit will include the XML Style Sheet Processor for turning an XML document into another format.

Oracle: www.oracle.com

The growth of electronic commerce is fueling rapid expansion in the Web site development industry, which has reached \$10 billion this year, according to research firm ActiveMedia Research (www.activemedia.com). Average investment for e-commerce Web site development this year for sites excluding those run by ISPs is about \$37,000, the research firm's report says.

Titled "Real Numbers Behind 'Net Profits,'" the report finds that media/portal houses made the highest investments, averaging about \$78,000 per site; business-to-consumer sites selling exclusively online invested an average of \$68,000; and retail and business sites spent an average of \$25,000.

Developers of European Web sites spent \$77,000 per site, twice as much as their North American counterparts.

Spending by Web site companies that anticipated achieving profitability within two to five years (\$59,000) was greater than that reported by firms that were already profitable or were expecting to report profits very soon (\$26,000), the report says.

Aventail to get extranets up fast

Company moves beyond Extranet Center software to offer an outsourced service.

BY CAROLYN DUFFY
MARSA N

SEATTLE — Aventail, a maker of secure extranet software, is now offering an outsourced service that promises to get a company's business-to-business electronic commerce infrastructure up and running in only 10 weeks.

Aventail will help customers plan how their extranets should work, install a turnkey extranet hardware and software product on the customer's premises, and provide the support needed to remotely manage and maintain the extranet. Companies pay for the Aventail service — dubbed Aventail.Net — on a per-user, per-month basis.

Aventail has chosen several partners, including IBM and RSA Data Security, to provide products and support for

Aventail.Net (see graphic, page 50). Customers will own and support the applications running across the extranet.

Aventail.Net is designed to reduce the time it takes for a company to set up an extranet from an average of 10 months down to 10 weeks, says Jude O'Reilly, director of product marketing for Aventail. On an ongoing basis, Aventail.Net will provide the services needed to activate users, provide help desk support and maintain availability of the system. Another advantage of Aventail.Net is that it requires no upfront expenditures.

Phil Schacter, director of the network strategies service at The Burton Group, says the managed service is a natural evolution for Aventail, which also sells an extranet software package called ExtraNet

Center. The software authenticates a company's online partners and controls their access to Web resources.

"Companies found it an attractive solution, but it was difficult for them to have the in-house technical skills to deploy," Schacter explains.

Schacter says Aventail.Net addresses several concerns of corporate network managers, including a shortage of technical staff skilled in extranets. He says Aventail.Net coincides with a movement to outsource management of virtual private networks and firewalls.

"Companies are trying to get their e-business acts together," he says, adding that he has not seen an offering similar to Aventail.Net from any other firm. "Companies will be very interested in looking at these kinds of managed services."

See **Aventail**, page 50

NetIQ expands Windows NT monitoring reach

BY JEFF CARUSO

SANTA CLARA — IT managers trying to get a handle on Windows NT applications will get some help this week, as NetIQ expands its management software to cover Active Directory and more than 30 NT applications.

Version 3.4 of NetIQ's AppManager software will monitor 11 more applications than the previous version, bringing into the fold programs such as SAP R/3 and Microsoft SNA Server. The software can also monitor Microsoft's server load-balancing technology and its electronic commerce server, called Site Server.

NetIQ has focused its efforts on NT, developing support for the platform as a specialty. Using management tools designed for a particular platform or application is necessary, says Corey Ferengul, a program director at Meta Group, a consulting firm. "True integrated management across all your platforms just isn't a reality," he says.

Taking on Active Directory

NetIQ's NT focus should prove useful in helping customers manage Microsoft's Active Directory, which will be a storehouse of information about users and applications distributed around a net.

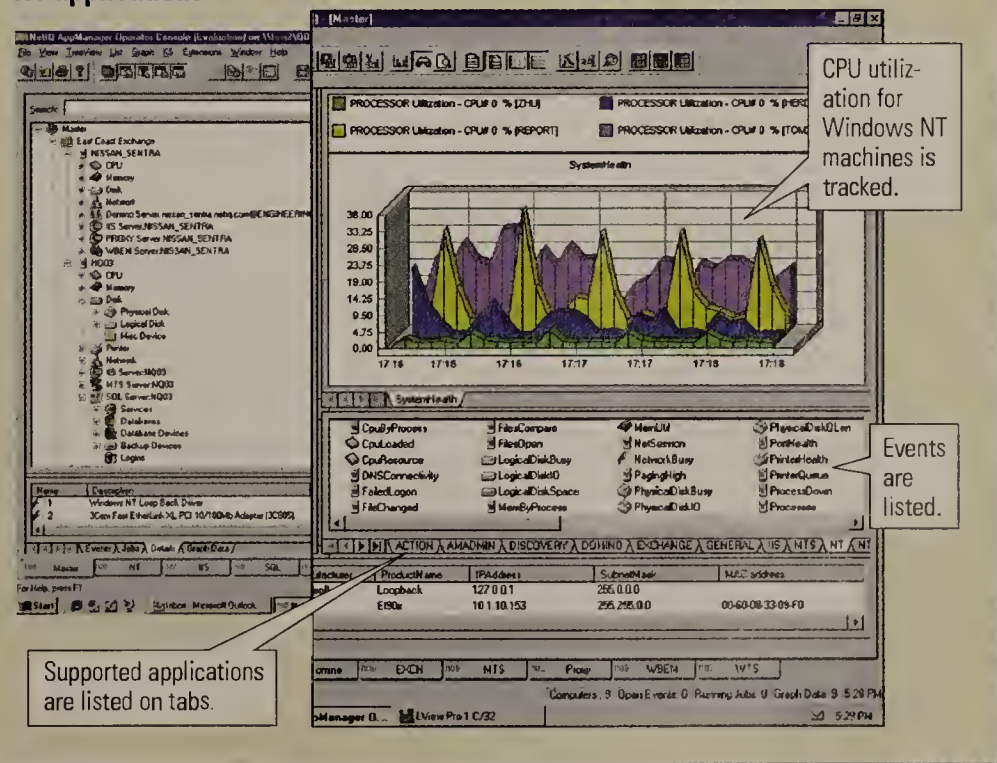
AppManager will monitor Active Directory for database-related problems. The NetIQ tool will also keep an eye on

how much traffic Active Directory generates by replicating itself; ensure that

See **NetIQ**, page 50

Window into NT

NetIQ's AppManager software tracks the performance and availability of Windows NT applications.



Supported applications are listed on tabs.

CPU utilization for Windows NT machines is tracked.

Events are listed.

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Sun readies two key Java development tools

Java Blend, Java Message Queue to simplify process of linking Java programs with back-end systems.

BY JOHN COX

MOUNTAIN VIEW, CALIF — In the next few weeks, Sun will release tools that will finally let Java developers easily link their programs with back-end data and applications.

The tools, Java Blend 2.0 and Java Message Queue (JMQ) 1.0, create a ready-to-use framework for building such links, thus freeing programmers from writing and maintaining this code themselves (see graphic). In theory, the tools should speed deployment of new Java applications that can work with existing databases and a range of enterprise applications.

Today, creating these links is hard work. Developers have to write their own database access codes using the Java Database Connectivity (JDBC)

interface. To let applications share information directly, via reliable message queues, is even harder because until recently there was no Java messaging standard, let alone tools based on a standard.

The database link

Java Blend 2.0 is used by a database analyst to translate the internal layout, or schema, of a database into a set of reusable Java objects, such as "customer" and "order." Or Java Blend can take a set of such Java objects, created by a Java developer, and translate them into a set of database tables for storing data about the customer and order.

Java developers no longer have to understand the inner workings of the database or puzzle over how to

create a high-performance query. All that complexity is in the objects, which the developers simply incorporate into the finished applications, using their favorite Java development tool.

This will be much simpler than writing low-level JDBC code, according to users such as Rick Bullotta, chief technology officer at Lighthammer Software Development in Malvern, Pa. JDBC is a simple, database-independent API for accessing relational data stores. Java Blend, which essentially automates the creation of JDBC code, is much more flexible and powerful in building data-intensive Web applications, Bullotta says.

Sun has labeled this Release 2.0, but the previous version was only available as an experimental product for developers. In response to user feedback, Sun invested a lot of effort into strengthening the reliability of internal mechanisms, such as memory

as a kind of answering machine for applications.

In a message queue environment, applications drop off, or publish, specific information, such as the data in a new customer order. Other applications, such as inventory or credit authorization, pick up, or subscribe to, the data they need to know.

With this publish/subscribe approach, users can add or drop applications without forcing developers to make changes elsewhere in the net, says Dennis Yocum, Sun's senior product manager for JMQ.

JMQ is based on the Java Message Service, a recent addition to the Java2 Enterprise Edition specification. Other companies are building similar application messaging products, and Progress Software has already released one called SonicMQ.

There are two parts to JMQ, which is based on middleware that Sun licensed earlier this year from Enron Communications. A server program

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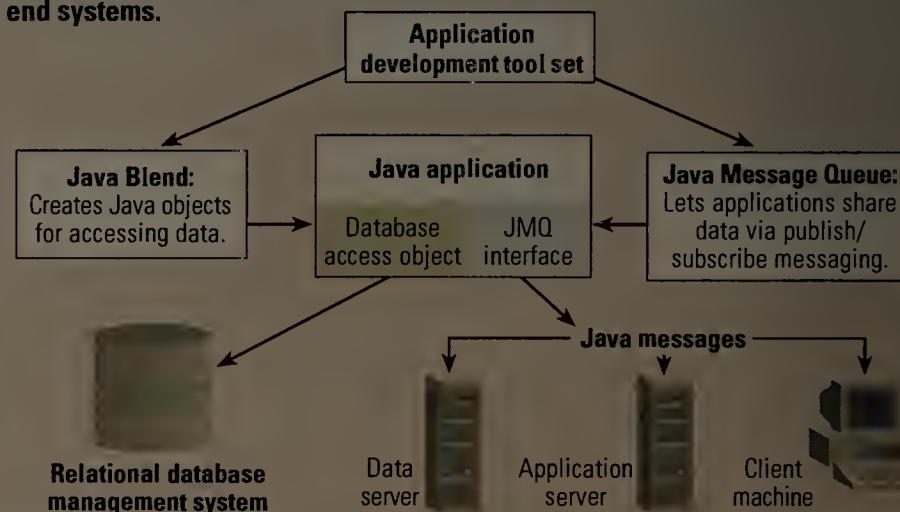


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Java jump-start

Sun's new programming tools — Java Blend and Java Message Queue (JMQ) — should make it easier for developers to link their applications with back-end systems.



management, and ensuring that Java Blend could handle hundreds of database connections at the same time, according to Dan Gilliland, a senior product manager.

Java Blend 2.0 has interfaces to Oracle, Sybase and Microsoft databases. The tool, which runs initially on Solaris and Windows NT, costs \$1,195 per developer and will ship later in November.

The messaging link

JMQ 1.0 lets Java applications exchange information through a message queue, which can be thought of

called the router moves messages between queues. The Java developer then incorporates into his application a set of JMQ client libraries, which contain ready-to-use code for handling communications with the router.

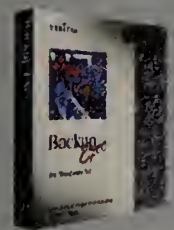
The developers' version of JMQ will be available later this year, priced at \$495 per developer. It runs initially on Solaris and Windows NT. The final production version will be ready during the first quarter of 2000.

Sun: www.sun.com/software/java/blend/; www.sun.com/workshop/jmq/index.html



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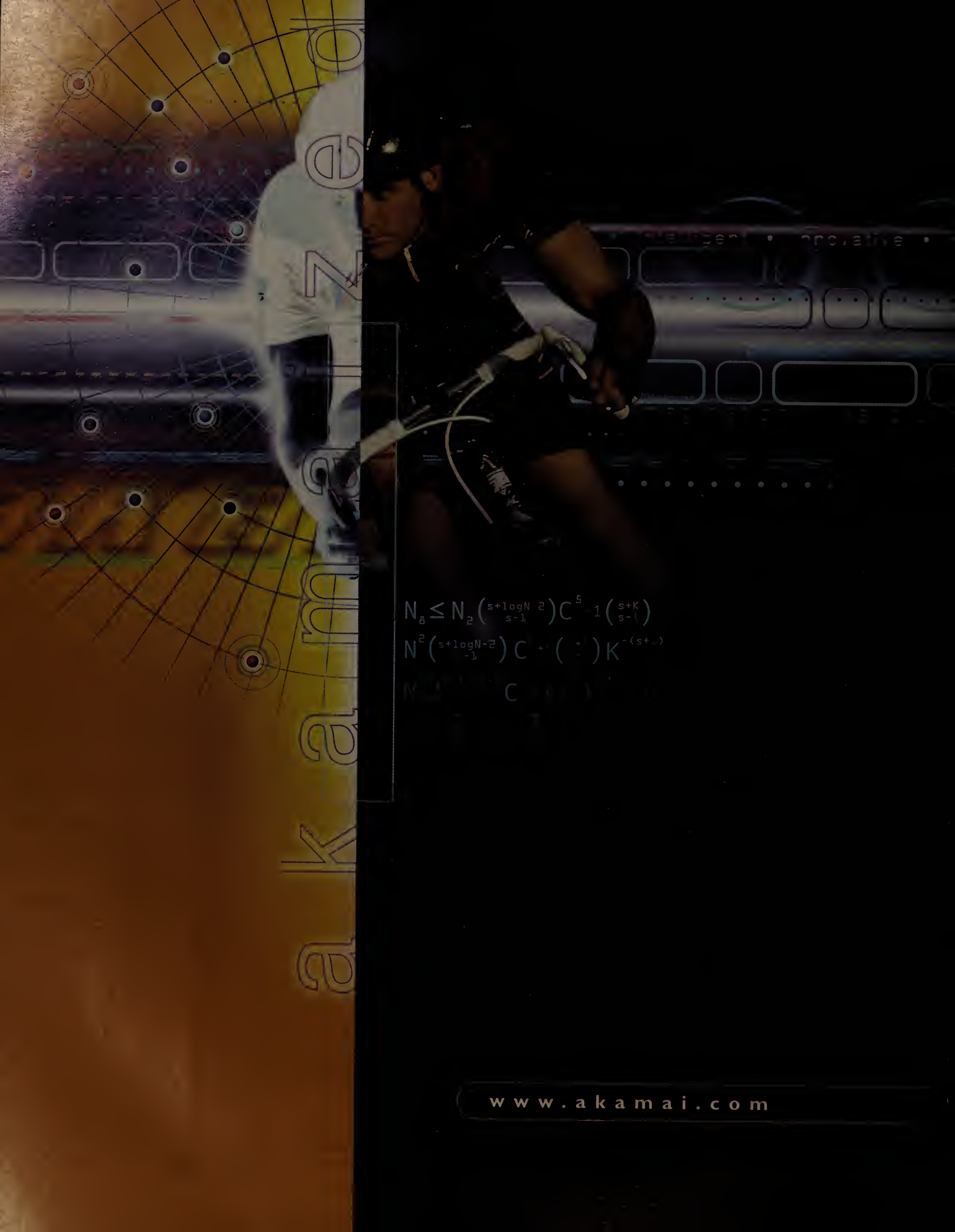
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$$N^2 \binom{s+\log N-2}{s-1} C + \binom{s+1}{s-1} K^{-(s+1)}$$

$$N^{2s} \leq C^{s-1} \binom{s+K}{s-1}$$

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Microsoft to rent out Office

BY JOHN FONTANA

REDMOND, WASH. — Microsoft last week made its most significant move

into the application hosting market by unveiling an online version of its popular Office productivity suite.

The company says it will offer Office

Online next year through its bCentral Web portal, a service for small to mid-size businesses.

Office Online will include all the Office applications: Word, Excel, PowerPoint, Access, Publisher, FrontPage and Outlook.

The move also is significant in that

it signals a shift in how Microsoft licenses applications. Office Online is merely Office 2000 with a new licensing model.

The model lets application service providers (ASP) license Office 2000, run it on Windows Terminal Server and sell connections to the server.

Previously, users had to provide their own copies of the application and client access licenses to an ASP before contracting for hosting.

"This sends a clear signal to [independent software vendors] that this is how software will be licensed in the future," says Roger Galego, a vice president at FutureLink, an ASP that plans to host Office Online. "By enabling applications to be hosted this way, it allows us to extend beyond offering a few applications to offering a corporate desktop."

Galego and Microsoft freely admit, however, that it could take two to five years before large enterprises with sizable deployments of Office on corporate desktops start to get interested in the hosted model.

But Office Online should give IT executives a peek at how they may rent software and complementary services, such as data storage and help desk support, in the future.

Sun and Corel are also planning online delivery of their productivity applications. The services from all three vendors should help jump-start the ASP market, which International Data Corp. predicts will grow to \$2 billion by 2003.

Microsoft will begin pilots of Office Online on bCentral this year with wholesale availability slated for early next year. Microsoft has enlisted 15 ASPs to help launch Office Online, including Qwest, USInternetworking, Equant, Verio and FutureLink.

Microsoft officials say fees for Office Online could range from \$50 to \$500 per user, per month depending on bundled services.

FutureLink charges \$113 per user for platform services and will offer Office for approximately \$20.

Sun will debut StarPortal, a componentized version its StarOffice suite available through service providers, in the first half of 2000. StarPortal originally was due for release next month, but Sun is still testing the software that the company acquired in August from Star Division.

Corel and FutureLink will offer a WordPerfect Office 2000 service by the end of the month. ■



Microsoft, with the help of ASPs, will soon be making Office 2000 available as a service.

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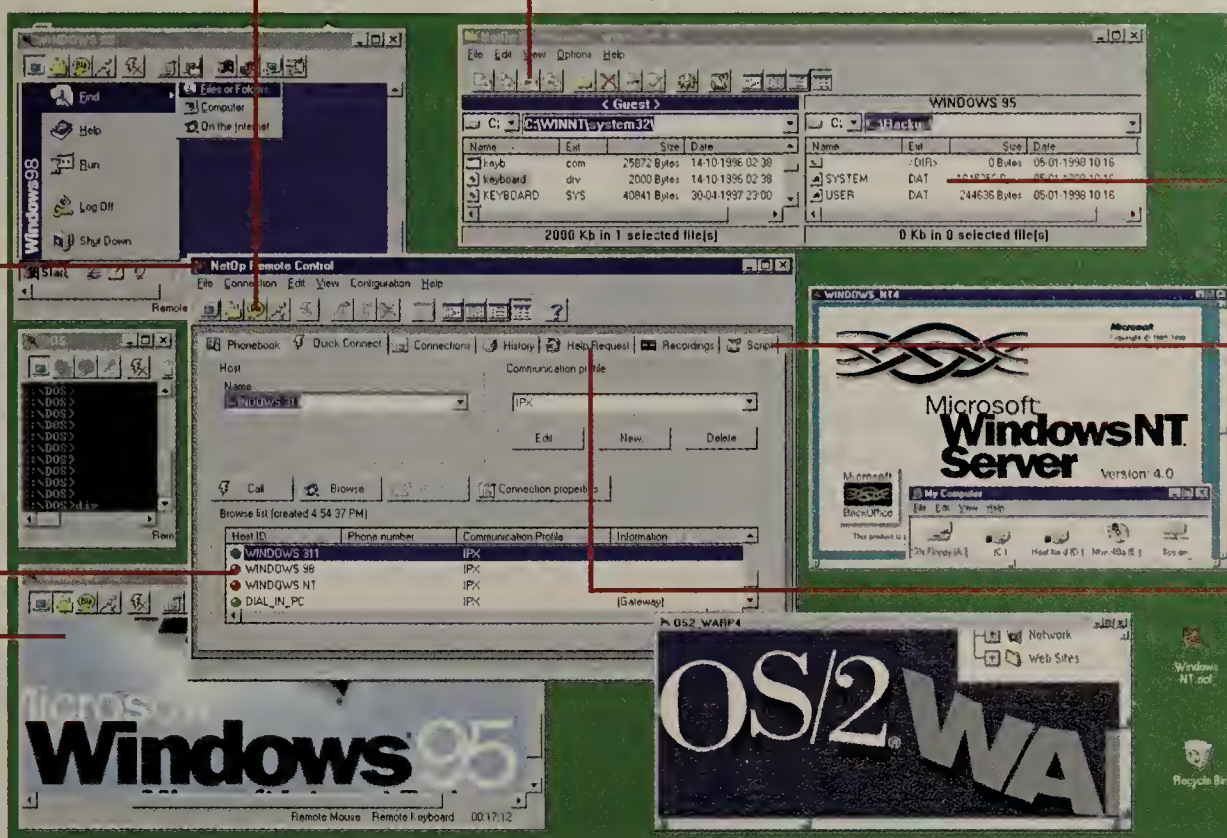
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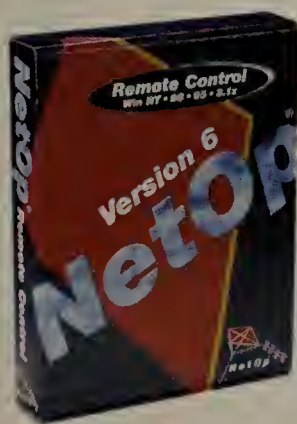
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Enterprise Applications

Aventail,
continued from page 39

Aventail officials say their firm is the first to offer a fully managed extranet service. In fact, the company has created a new name — extranet service provider — for the category. "The alternative is to buy an extranet platform and integrate yourself or hire an integrator," O'Reilly says.

One company that found Aventail.Net appealing is the Northwest Byproducts Group of Philips Services, a \$2 billion hazardous waste management company. Northwest, which has about 200 employees and does \$35 million per year in business, is developing an extranet for its customers in Washington state to place orders for hazardous waste removal. Today, customers must talk to a Philips employee every time they need a drum of waste material removed and treated. With the extranet, customers will be able to access Philips' order-processing system over the Web, view their order histories and place orders 24 hours a day.

"We needed to find a way to open up our order-processing system to be

more friendly and more interactive to our customers," says business manager Jack Wolfen. With the extranet, "we'll give them access to their accounts over the Internet. They can submit queries, get them processed and get a date for waste transportation. We'll confirm the order via e-mail."

Wolfen's group has been working on the extranet for several months, but a chance meeting with Aventail officials led to a business deal that will speed deployment significantly. Wolfen likes the fact that with the Aventail.Net service he can launch the extranet in January, without having to add to his IT staff. Wolfen also says he can assure his customers that their data will be secure — a necessity in the waste management business. Ultimately, he's hoping the extranet sets Philips apart from a service perspective and attracts new customers.

If the Aventail.Net service is successful, Wolfen hopes to roll it out across

the company. "This is going to be revolutionary for our company and for our industry," he says.

Aventail.Net is available in the U.S., with worldwide availability slated for early next year. Pricing is \$30 per user, per month for 5,000 users.

Founded in 1986, Aventail is a privately held company specializing in secure extranet software. The company has \$10 million in venture funding from Trinity Ventures, Hewlett-Packard and others.

Aventail: www.aventail.com

NetIQ,
continued from page 39

the directory has enough disk space allocated; watch for whether the database is growing too fast; and check log files for errors.

The new version also works with additional server hardware management tools, alerting an IT manager if a server's fan has stopped or a power supply is running low. AppManager adds support for IBM and Siemens server management tools. Previously, NetIQ's software worked with Compaq and Hewlett-Packard management tools.

The new version also monitors backup software, including Computer Associates' ARCserveIT, Legato NetWorker, and Veritas Backup Exec. In addition, AppManager will be able to monitor Windows 2000 and the latest versions of Citrix MetaFrame and Lotus Domino.

AppManager 3.4 is scheduled to ship next month. Software for each managed system starts at \$600, while management consoles start at \$2,500.

NetIQ: www.netiq.com

A little help from some friends

Aventail says it can install an extranet system in 10 weeks, rather than the industry average of 10 months. The company uses technologies from the following partners to accomplish this:

Company	Technology, product or service
IBM	SecureWay Directory Server
RSA Data Security	SecurID token authentication
VeriSign	OnSite digital certificate service
F5 Networks	Big IP load-balancing appliance
PricewaterhouseCoopers	Business process design services

VOICE

DATA

VIDEO

Information is

Upgraded tools track e-mail server performance

BY JOHN FONTANA

These days the health of corporate mail servers sometimes seems almost as important as the health of the company CEO.

When mail service is down, business slows and telephones ring incessantly in the corporate data center. Later this month, two vendors will set out to make those phones ring less often. Tally Systems and MessageWise will ship upgraded products for monitoring mail servers.

Tally is readying MailCheck 4.3, which runs on Windows 3.11, 95 and NT. Version 4.3 adds a feature called Star Polling that enables companies to monitor mail delivery between any two servers, whereas previously the software only let companies monitor mail delivery between servers and a central hub server.

Tally also will integrate its IP Check into MailCheck to monitor the health



of IP-based transport devices, such as routers or gateways. In addition, Tally is including a Java-based management console that runs in a Web browser.

"We can now traverse our entire wide-area mail network and compile monthly reports on availability and response time," says Michael Green, messaging analyst for Thomson Financial in Boston. He says the monitoring system uses a red light/green light display to report the health of his servers, which he polls every 15 minutes.

Green is using MailCheck to monitor Microsoft Exchange and Lotus Notes servers, but the software can monitor nearly any mail server, including Lotus cc:Mail, Novell GroupWise, Netscape Mail, X.400 and Native

Simple Mail Transfer Protocol/Post Office Protocol systems.

Early next year, Tally plans to add performance-monitoring tools to MailCheck, which costs \$11,000 for 5,000 users.

Focus on performance

Performance monitoring is the area in which MessageWise is focusing its efforts. With Version 3.0 of Messaging Manager's Assistant (2MA), which is designed for Microsoft Exchange, MessageWise has added a set of monitoring templates. This is a collection of objects to be monitored, including queues, processor utilization and disk space usage. The templates, which can be used to collect performance data or monitor events, also can be customized for rollouts to large sets of similarly configured servers.

Harold Dyck, president of MessageWise, says 2MA can monitor thousands of Exchange servers regardless of location.

MessageWise also has added Web reporting tools, an Add Server Wizard and SNMP support to 2MA, which does not require agents on every mail server. Pricing on 2MA 3.0, expected to ship by year-end, starts at \$1,000.

Tally: www.tallysystems.com; MessageWise: www.messagewise.com

www.nwfusion.com

MORE ABOUT MESSAGING

White paper: Managing electronic messages.

Best practices for message management.

DocFinder
5525
find it online

The companies who put information to work in new ways are the ones who will succeed time after time. If you're driven to be among them, it's essential to have the right communications provider – one who has an intelligent network architecture, high-speed capabilities, and leading-edge technology solutions. And if your provider also shares your vision and has the ability to take you as far as you want to go, nobody can beat you.

That's Electric Lightwave. We're a nationally acclaimed Internet backbone provider, with high-speed national data and longhaul

**ELECTRIC
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The new medium of exchange.

power. Let it rip.

networks – all engineered to accommodate our customers' most aggressive goals. With our broadband network capabilities, there's no limit in sight.

The point is this: The strength of your company is in its ability to keep up with your customers' voracious appetite for information. To talk to a high-octane provider, call us at 1-800-9-TRY-ELI. Or go to www.eli.net today.

'Net Insider . Scott Bradner

A PERFECT EXAMPLE

It would have taken a lot of hard work to have created a better bad example.

RealNetworks' approach to secretly

collecting data on its customers is a perfect example of what Internet users are convinced that all 'Net companies do. Although RealNetworks reacted

quickly to change its approach, the company's total obliviousness to the privacy aspects of its behavior is breathtaking.

On Monday, Nov. 1, *The New York Times* reported that RealNetworks' downloadable RealJukebox CD player collected all sorts of data on its cus-

tomers and automatically sent it back to servers at RealNetworks' corporate offices.

Users of the RealJukebox software are required to enter their names, e-mail addresses and ZIP codes to register. Every time the program starts up, it sends back to the company the number of songs the user has stored on his hard drive, their formats and quality level, what type of music the user likes to listen to and the type of any portable music player that might be connected to the user's computer. In addition, every time a CD is inserted into the computer's CD-ROM drive, the CD title is sent to RealNetworks.

Spokesmen for RealNetworks said the company was collecting the information as a way to customize services for its customers and to be able to offer music selections targeted to users based on what RealNetworks knew about what users were listening to.

By later the same day that the RealJukebox story broke, RealNetworks had figured out that there was a flaw somewhere in its thinking (if thinking had actually been involved in programming the system this way). In light of this, the company announced the availability of a downloadable patch to disable the reporting features.

I can imagine that RealNetworks thought that some of its customers might even be happy for the pointers to music they might like. After all, Amazon.com's users seem to like the same sort of thing. But RealNetworks did this in secret, not even noting the practice in the license agreement or in the privacy statement on the company's Web page. The fact that RealNetworks gathered this information and must have assumed that no one would notice indicates a reality disconnect that would seriously worry me if I were an investor.

I will note that RealNetworks has not yet said it will disable the information-gathering servers or that new versions of the program will not return any information to RealNetworks. Nor has the company said that its very popular RealAudio and RealVideo players do not gather such information. Since few of the 13 million registered RealJukebox users will get around to patching their software, RealNetworks will keep receiving a lot of information unless the company shuts down the servers.

So far, RealNetworks is a case study in what not to do if you are an ISP — I hope that other companies will learn from this.

Disclaimer: Not even the Harvard Business School would use a case study this dumb, so the above observation is mine alone.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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What's more, we'll help you determine the precise level of protection you need, complete with our unmatched monitoring and shutdown software and on-site support.

To learn more, check out www.powerware.com/359. Or call us at **877-PWRWARE (877-797-9273)**. It's the kind of move that can earn you the corner office.

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Technology Update

An Inside Look at the Technologies
and Standards Shaping Your Network

Ask Dr. Intranet

By Steve
Blass

I have recently been hired by a health care company in the Pittsburgh area and given the task of evaluating its current infrastructure.

The company is running TCP/IP only in a 300-node Windows NT network. Internally, it is using a full Class B address with its default mask of FF.FF.0.0 (255.255.0.0). I would like to create 50- to 60-node subnets and bring the infrastructure to a stable, manageable state. What do you recommend?

Via the Internet

Map out the physical infrastructure first to see if there are obvious ways to segment the network physically. For example, individual floors, buildings or locations might be natural subnet candidates. Then, map out your IP address assignments on the physical map to see whether your IP space is conducive to segmenting the network. If it isn't, you might have to go through an IP re-addressing exercise.

Use a sniffer to monitor your current network traffic to see whether network utilization is a concern.

Even if you don't need to segment your network, you'll probably want a server segment and workgroup segments to isolate broadcast traffic and reduce network congestion. You can find good network design guidelines at Network World Fusion (www.nwfusion.com) and equipment vendor sites.

Blass is a network architect at Sprint Paranet in Houston. You can reach him at dr.intranet@paranet.com.

Win 2000 paves a way for WINS exit

BY GARY ROSENFELD

Microsoft's Windows 2000 will arrive with a feature set rich in added manageability, scalability and the means for Windows networks to be emancipated from reliance on NetBIOS. Starting with Windows 2000, Microsoft has publicly embraced an architecture that is NetBIOS-free.

Currently, in order to operate in a TCP/IP enterprise environment, Windows NT relies on the Windows Internet Name Service (WINS). So administrators should be forewarned that until an organization has migrated fully to Windows 2000 and eliminated any NetBIOS-based applications, WINS will continue to play a role.

Windows 2000 also introduces Microsoft's Active Directory. This is a directory service based on a set of standard protocols that provide a single store for many types of objects, including users, groups, printers, servers and applications. In order for Active Directory clients and applications to locate these resources, Windows 2000 relies solely on the Domain Name System (DNS) to provide name resolution and resource location services. Reliance on DNS opens the door for retiring WINS servers.

In order to provide services on a Windows 2000 network, a DNS server needs to be compatible with two proposed standards: the Service Location Resource Record (SRV RR) and the Dynamic Update protocol.

SRV RRs allow clients to locate services throughout the enterprise. For example, servers acting as domain controllers create an SRV RR entry in the DNS table indicating that they can accept domain logons. When a client needs to locate a domain controller to authenticate a user, it will query DNS and pull down a list of domain controllers to contact.

The Dynamic Update protocol provides WINS-type functionality to DNS. It allows clients to dynamically register their names and services with DNS. Traditionally, DNS maintains a static database that is updated manually. By providing dynamic updates, DNS administration is reduced and it becomes a viable solution for Windows environments running Dynamic Host Configuration Protocol (DHCP).

If administrators decide to implement the DNS service included with Windows

2000, the DNS database can be contained within Active Directory, eliminating much of the replication traffic required when duplicating large DNS databases.

The use of DNS for resolving names and locating resources only occurs when Windows 2000 machines need to communicate with other Windows 2000 machines. In order to communicate with older Windows 95, 98 and NT clients, Windows 2000 machines will continue to

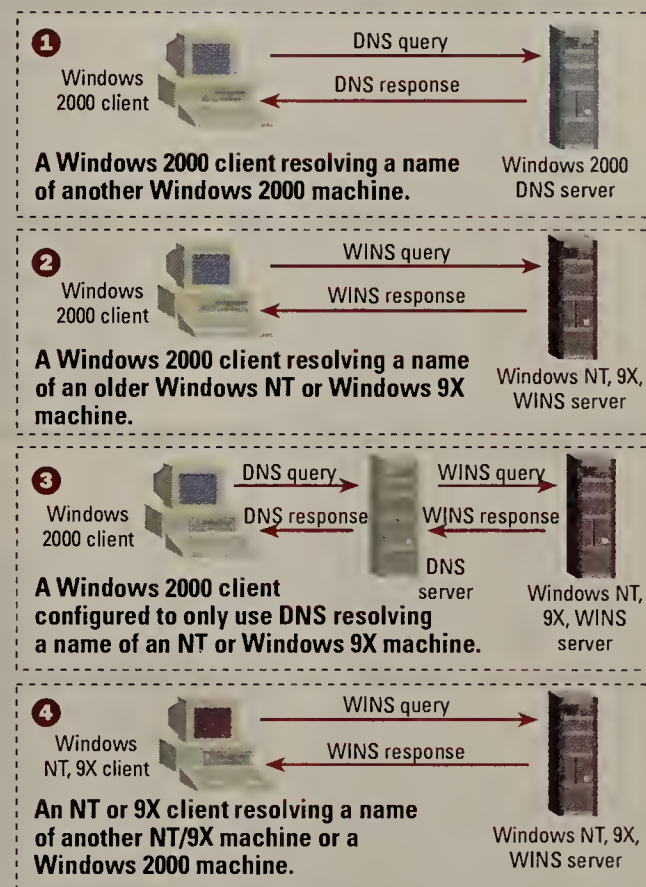
First, are legacy applications that require NetBIOS names running on your network?

All Microsoft operating systems prior to Windows 2000 utilize NetBIOS names for system and application use. Many of the applications built to run on these older clients require NetBIOS names.

Second, will your existing computers and programs be able to use DNS for name resolution and locating resources?

UPCLOSE While WINS remains in your network ...

For Active Directory-based clients and applications to locate network resources, Windows 2000 relies on the Domain Naming System (DNS). Reliance on DNS opens the door for retiring WINS servers and also presents a variety of possible scenarios within a network that is gradually migrating to Windows 2000, as illustrated here:



use WINS. Alternatively, DNS could be configured to perform a WINS lookup and the Windows 2000 machines can be configured to only query DNS. The DNS service would then perform the WINS lookup and pass the information back to the client. However, in order for older clients to find Windows 2000 resources, WINS will be used.

There are exceptions to these examples. For instance, when an older client is utilizing a Winsock application — for example, a Microsoft Exchange client — DNS will be queried first to resolve the name of the Exchange server, which could be running on NT 4.0 or Windows 2000.

Two important questions need to be answered before WINS can be removed from your network.

Almost all computers and applications require naming services. Therefore, prior to making the decision to rid your network of WINS, ensure that your systems will be able to make use of DNS to perform these services.

With the release of Windows 2000 and Active Directory, Microsoft is firmly committed to supporting a NetBIOS-free network, but it is clear that WINS has not packed its bags for the journey home to Redmond. Therefore, network administrators need to prepare their IP environment to maintain and improve WINS services and start thinking about DNS integration.

Rosenfeld is a network systems consultant for Lucent NetCare Professional Services in Philadelphia. He can be reached at grosefeld@lucent.com.

Gearhead — inside the network machine . Mark Gibbs

CONFOUNDED COOKIES LEAVE A STRANGE TASTE

Cookies streamline my work by automatically logging me on to certain sites and remembering my preferences on others. The problem? I use three computers, and I haven't found a way to share cookies among them. How can I replicate cookies among multiple systems?" — Mark Jasen, Sterling Software, Inc.

The above question from Mr. Jasen, a reader of the Network World Web Applications newsletter penned by Gearhead's evil twin, Mark Gibbs (subscribe at www.nwfusion.com/focus/index.html#Web), is a very good one.

It points out how nice it would be to have a single sign-on system that really worked. Alas, there's no single sign-on product that Gearhead has found that doesn't involve huge amounts of implementation and deployment effort. Moreover, most of them cost enough to fund the economy of a small country.

So, let's see what we can come up with. It will, of necessity, be somewhat of a kluge, but as Gearhead's sainted grandmother used to say: "If wishes were horses, beggars would ride."



One approach that comes to mind is to use a file replication or backup system to copy the cookie data from PC to PC — either the Windows 98 briefcase facility or a backup utility could be used.

But there's a problem: Internet Explorer stores its cookies in the subdirectory `c:\windows\cookies` in a separate file for each cookie and there is a cookie index file, `INDEX.DAT`, in the same place.

As far as Gearhead can determine (and documentation on this point is thin, to say the least), this file indexes all of the cookies for a fast lookup and is permanently held open by the system even if Explorer isn't running (any surprise that Microsoft has been judged as behaving monopolistically?).

Being permanently open means that you can copy it, but you can't replace it under Windows.

Gearhead tried copying Explorer cookie files to another machine's Explorer cookie subdirectory and then restarting it in the hope that Explorer would rebuild the `INDEX.DAT` file on start-up, but it didn't seem to work. If it had worked, Gearhead's test would have resulted in an automatic logon to a test site, and that didn't happen. Go figure.

What this means, unless Gearhead misses his guess, is you have to leap through serious flaming hoops to share cookies between two or more PCs running Explorer. If you find a solution to this problem, please write and let Gearhead know.

Things aren't quite so aggravating under Netscape Navigator: All cookies are kept in a single file named `COOKIES.TXT` that lives in `c:\programfiles\netscape\users\xxx`, where `xxx` is the ID of the current user. You can copy this file with wild abandon, but Navigator should be exited before you replace the cookie file — Navigator opens and closes this file as required, and it is possible that your new cookie

file could be overwritten.

If you want to see the cookies from the site your browser is currently looking at, enter "JavaScript: alert (document.cookie);" as a URL and voilà! All will be revealed in a rather crude way.

But if you want to really find out about what's happening with cookies on your PC, check out Cookie Pal from Kookaburra Software (www.kburra.com). This utility monitors Explorer and Navigator as they receive cookies and allows you to control whether cookies are accepted or rejected on either or both a session or site basis. Cookie Pal also reports on the contents of all cookies received within a session as well as all cookies stored in the system.

It's interesting to see what cookies are sent to your browser. For instance, Excite.com sent cookies that seem to imply Gearhead wasn't registered even though the opposite was the case, and the cookies had expiration dates apparently set for 2003, 2010 and 2020. Now there's forward thinking.

Send your cookies to gb@gibbs.com.

Network World Fusion Spotlight

News, tips and tools from our Web site

Get ready to rumble

Should Microsoft be broken up? That's our Fusion Face-off topic for the week. We've got two industry experts ready to hit the mat over the issue. Hillard Sterling, senior litigator for Gordon & Glickson P.C. in Chicago, faces Ed Black, president of the Computer and Communications Industry Association, to hash out how a divided Microsoft would benefit you. Black and Sterling will be online all week, so head to

Fusion and hit 'em with your questions.

DocFinder: 5547

You be the judge

Judge Thomas Penfield Jackson released his findings of fact last week in the Department of Justice vs. Microsoft case. But the case is far from over. Now it's time for you to pull out your gavel. What should happen in light of the ruling? What kind of settlement should Microsoft offer? Which companies stand

to gain from Jackson's harsh decision? Log on to our forum and let us know.

DocFinder: 5440

Help Desk

How do you set up an intranet? A new Microsoft Certified Software Engineer asks Help Desk Editor Ron Nutter how to pull all his firms' divisions into one network. The reader wants to hook each of the divisions, which host around 30 to 50 Windows 95 and 98 clients each, to a central Exchange server and a corporate Web site. But before he can worry about his Microsoft applications, he has to decide on the best connection method. His ISP is also his local phone company. Nutter tells him to be mindful of the distance he is trying to bridge between offices and to consider VPNs. Find out what else Nutter suggests in this week's column.

DocFinder: 5548

In the Works

What if you could harness the power of all the high-end computers in the world? That's one of the projects Argonne National Labs is working on. Funded in great part by the Department of Energy, Argonne is the epicenter for some groundbreaking projects, including virtual reality caves and the Next-Generation Internet. In "In the Works," our new series about the future of technology, you'll meet two Argonne executives who will let you in on their coolest projects.

DocFinder: 5549

The death of pagers?

In a recent article, online columnist Fred McClimans argued that pagers will be obsolete in a few years. He said advances in cellular phones will obviate the need for a separate device. But it's an issue pager companies do not take lightly. The head of the Per-

sonal Communications Industry Association wrote back: "At PCIA, we have learned that in ever-exploding numbers, consumers want messaging applications as part of their telecommunications package. For technological, economic and regulatory reasons, this has been a concept that mobile voice networks have failed to capitalize on, and a place where paging/messaging networks still hold a considerable, albeit temporary, advantage." What do you think?

DocFinder: 5550

Help Desk

Ron Nutter is standing by to answer your networking questions. Read his column every week on Fusion. *DocFinder: 2450*

www.nwfusion.com

A special report to *Network World*

SPECIAL REPORT PART TWO

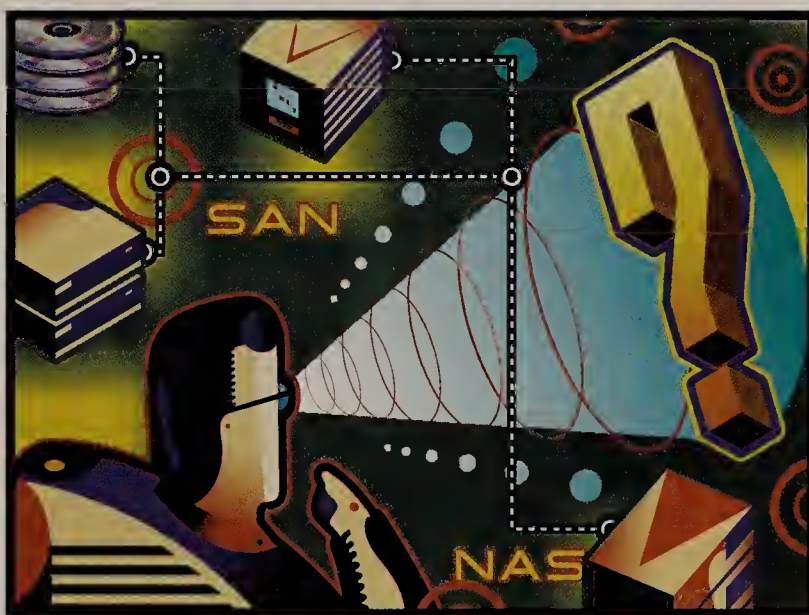
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STORAGE-AREA NETWORKS

ENTERPRISE SOLUTIONS

Finding your storage path

Multiple storage choices can leave you lost and confused, unless you have a clear strategy. Here's how to decide.



PLUS: Deciding which strategy is right for you

PART TWO: SAN STRATEGY



Choose wisely

Picking a clear storage strategy is difficult but not an impossible task

By Eric Hammond

WHEN PLANNING a storage strategy, there are plenty of options. In fact, you may have too many choices: storage-area networks, network-attached storage, and centralized vs. decentralized storage. Add to that the sea of acronyms and buzzwords that come with them — SCSI, RAID, Fibre Channel, online, and near-line — and, suddenly, picking a clear strategy seems futile.

But if you step back and look at the big picture, think about your long-term needs and then start working through the details, a clear strategy can emerge. Let's explore different options for storage strategies and look at the pros and cons of each.

The three options that we'll look at include

the traditional storage model, network-attached storage (NAS), and storage-area networks (SANs). We'll look at how each of these is implemented, the issues you might face in utilizing them, as well as the benefits each brings to the table.

THE TRADITIONAL MODEL

For lack of a better term, let's call server-attached storage the traditional storage model. In this model — most prevalent in organizations today — storage devices are attached directly to the servers that use them.

Traditionally, storage devices — which may include disk drives, tape drives, optical drives, RAID systems, tape libraries, and optical jukeboxes — are directly attached to servers. Of course, you may also find any of these devices attached to various client sys-

tems, but let's focus on the server for now.

At the enterprise level, most of these devices are attached via SCSI.

The biggest benefit to the traditional model for storage is that it is understood well. People have been carrying it out for a long time, and they know how to make it work. Server-attached storage isn't going to disappear anytime soon. It does, however, create some problems that other storage strategies can alleviate.

On the lower end — say in the workgroup file and print arena or in the small application server market — server-attached storage brings a lot of complexity and cost to the table that might not be necessary. For example, is it really a good idea to maintain a Windows NT 4.0 server, which is designed to meet a variety of enterprise-computing

▷ CONTINUED ON page S7

ILLUSTRATIONS BY STEVE LYONS



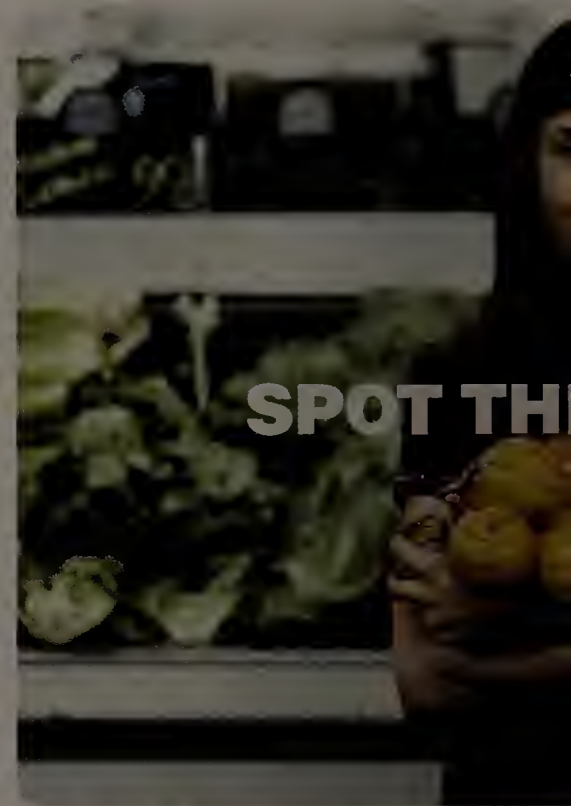
e-business

**BEFORE THEY CAN
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The supermarket chain meets the supply chain. On the Web, access to timely information **FYI** helps suppliers keep products in stock, inventories low and customers returning.



FYI Company employees can quickly over an intranet to determine who's

ON THE WEB, EVERYTHING STARTS WITH INFORMATION. EVEN IN A SUPERMARKET. FROM e-SHOPPERS PLACING ORDERS ONLINE TO e-SUPPLIERS FILLING THEM. YOUR CHALLENGE: KEEP INFORMATION WITHIN REACH OF PEOPLE WHO NEED IT.

IBM ENTERPRISE SAN

A MORE RELIABLE WAY TO MANAGE e-BUSINESS INFORMATION.

Without a doubt, the success of your e-business relies on greater numbers of people being able to access even greater amounts of information. Whenever and wherever they need it. Keep even one person waiting, and business may go elsewhere.

It's your job to make sure that doesn't happen.

The challenges are many. For instance, as more of your business continues to migrate to the Web, the demand for information will touch everything from e-commerce to supply chain management to business intelligence to customer relationship management.

You will have to more efficiently manage the ever-increasing

amounts of information that e-business requires – information that can grow by 800 percent every year.

You will have to provide customers, employees and suppliers with round-the-clock access to timely information on a variety of platforms – even during peak traffic periods. And, should any data accidentally be deleted or derailed, you will have to be able to recover it quickly – before any business is lost.

How you store, manage and protect this valuable resource can be the difference between closing a sale and a closed door.

SEPARATE THE STORAGE FROM THE STORE. If your company is like most, crucial information is spread across a variety of task-oriented servers. These one-to-one server and storage relationships are neither practical nor efficient when dealing with huge volumes of e-business data.

An IBM Enterprise Storage Area Network (SAN, for short) takes an entirely new approach. Basically, a SAN is a separate, centrally managed network dedicated to managing information.

THEY HAVE ACCESS THE INFO



ture and analyze up-to-date sales data
ing and what's selling in which locations.



Information on past purchases lets businesses use the Web to personalize promotions,
FYI anticipate future needs and strengthen customer relationships — today.

TO MATION.

Instead of having separate
“islands of information,” an
IBM Enterprise SAN gives
you a shared pool of data that
can be accessed by everyone.

The benefits are enormous.
Consider this: as much as 60

percent of LAN traffic stems from data backup. By moving
storage to a SAN, you will free up bandwidth so user requests
can be handled more quickly, while data backups can be
completed in much less time (a backup that once took 6 hours
can now be done in 20 minutes).

You can put new and updated information up on your
Web site in one-quarter of the time needed previously.
You can easily “plug in” additional storage capacity without
taking your systems offline. And you will have a far more
cost-efficient and staff-efficient way to manage all your multi-
platform and multilocation information.

PEOPLE WHO GET IT. PEOPLE WHO CAN MANAGE IT. Only IBM
can offer the complete range of services, hardware, software
and technology needed to successfully get your Storage Area
Network off the ground.

IBM Global Services has decades of storage experience
spanning a variety of industries and platforms, as well as
scores of qualified storage consultants on hand. People who can
help you transform your current systems into an open and
integrated SAN solution — one that is designed
to extract the most value from your data.

What role does your information play in
e-commerce, in supply chain management,
in business intelligence, or in enterprise
resource planning? From early consulting, planning and
design through implementation, IBM Global Services will help
you align your SAN and business priorities so information
flows more freely.

If you're going to do business on the Web, it's imperative
that information is consistently available, secure and well-
managed. All the time. IBM can help here, too.

Tivoli Systems Inc., a worldwide leader in IT management
solutions (and an IBM company), can help you meet the





IBM IS AN IDEAL PARTNER FOR ANY COMPANY LOOKING TO MOVE ITS CRITICAL BUSINESS INFORMATION TO A SAN. HERE'S WHY:

FYI

IBM GLOBAL SERVICES

The 131,000 people of IBM Global Services have the experience and skills to transform your current storage systems into an open, responsive and cost-effective SAN solution.

FYI

IBM SERVERS (A.K.A. *magic box*)

Only IBM makes servers for every major platform: UNIX, AIX®, Windows NT, Novell NetWare, Linux, OS/400® and OS/390®. Most are SAN-ready already.

FYI

IBM STORAGE SYSTEMS

IBM is a leader in storage technology, offering a full line of disk, tape and optical solutions that let users access and share information anywhere across your enterprise.

FYI

TIVOLI STORAGE MANAGEMENT

Tivoli provides an integrated, open and end-to-end SAN solution for managing backup, archiving and data recovery from a single location.

complex demands of managing a SAN. Tivoli's fully integrated and end-to-end SAN management solutions feature LAN-free backup, archiving and data recovery across virtually all platforms. You get a central view of information across your enterprise, improved data throughput and drastically reduced backup and restore times.

Your users get something, too: access to the information they crave.

The magic box is an IBM @ business server.

Information can magically transform your business into an e-business. Provided that the servers handling your information are accessible, scalable and secure. IBM excels at getting the magic out of the box.

In fact, no one understands e-business better than IBM, because no one knows storage and servers better than IBM. Take our Netfinity® servers. Leveraging years of enterprise experience and cross-platform know-how, a Netfinity server is designed to power your SAN with minimum effort and maximum results. Think of it as a high-availability e-business server at an affordable price — a magic box.



Where you store information is as important as what's being stored. IBM is a leader in storage technology. Like the IBM Enterprise Storage Server.™ It speeds up access to information across all major platforms — Windows NT®, UNIX®, AS/400®, S/390® and Novell® included. It can be upgraded with additional storage capacity, on the fly. And it provides a foundation for true data sharing — the ultimate magical promise of Storage Area Network technology.

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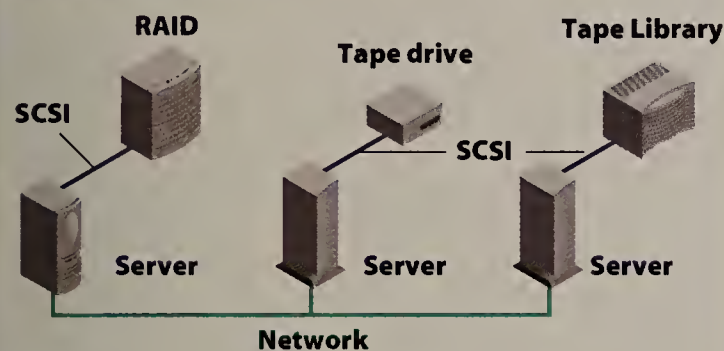
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Storage strategies

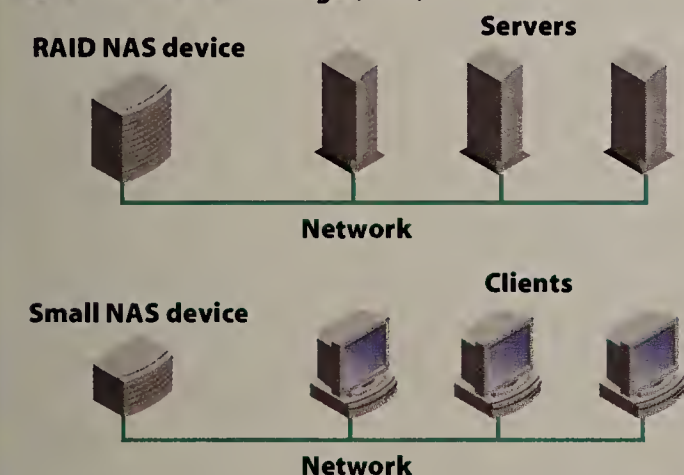
There are plenty of storage strategies available, and choosing the right one requires a thorough analysis of your current and future needs.

Server-attached storage



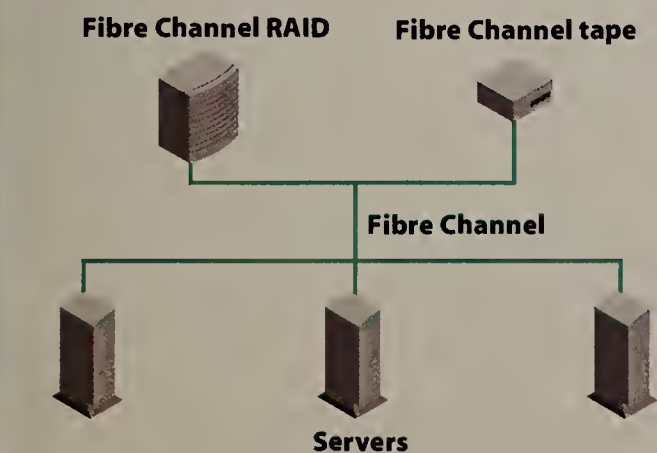
Pros	Cons
<ul style="list-style-type: none"> Well-understood Server flexibility 	<ul style="list-style-type: none"> Storage devices bound to servers Reconfiguration difficult

Network-attached storage (NAS)



Pros	Cons
<ul style="list-style-type: none"> Servers can be added Easy administration 	<ul style="list-style-type: none"> Network is failure point Decentralized

Storage-area network (SAN)



Pros	Cons
<ul style="list-style-type: none"> Highly configurable High-performance Very reliable 	<ul style="list-style-type: none"> Expensive Some technologies immature

CONTINUED FROM page S2

needs, for a workgroup that merely needs to share files and access a common printer?

Although the answer for many organizations today is "yes," it's pretty clear that an appliance-like device created for the single purpose of sharing files and printers for desktop users could be a more attractive option. It would seem wise to eliminate the hardware and software that isn't really needed to perform the task at hand. We'll explore this more in the NAS section.

At the high end, the problems with server-attached storage are more complex. Let's start with SCSI. SCSI is certainly a great protocol. But to implement it, one must face some harsh realities. Although the latest version of SCSI is light years ahead of the original SCSI specification in terms of performance, cable lengths, and the number of devices on the bus, some problems remain.

You can attach up to 15 devices to a SCSI bus, but many of the devices out there, including disk drives and modern tape and optical drives, can monopolize most of the bandwidth on the bus, even when the bus speed is 40MBps.

This isn't a big deal on a server with a few disks and a tape drive. But suppose you want to attach a library with six tape drives and a robotic tape picker, all of which are SCSI devices. At most, you can expect to attach two tape drives to a SCSI bus and still manage to get the best performance out of them. Even assuming that you put the picker onto an existing SCSI bus (it should not require that much bandwidth), you're still looking at adding three SCSI buses to the host system. How many PCI slots does it have, anyway?

Fibre Channel can solve some of these problems, even in a server-attached scenario (as opposed to a Fibre Channel-powered SAN). Fibre Channel allows more devices to be attached to a faster bus. But, because currently no tape drives can be directly attached via Fibre Channel (they all

require a bridge between the Fibre Channel and the SCSI drive), the SCSI issue doesn't completely disappear, although you can reduce the number of SCSI adapters that are required on the server.

The next problem with server-attached storage is capacity planning. Backing up a set of servers typically involves attaching a tape drive or tape library to one of the servers, which then becomes the backup server. Depending on the backup demands, this can require an additional server on the network, simply to provide access to the tape drive. There has to be a better way.

Solutions to many of these problems may exist in either a NAS or a SAN environment.

NETWORK-ATTACHED STORAGE

NAS is a strategy whereby traditional servers are replaced with storage "appliances" — devices with specific storage functions, and little other capability.

NAS holds appeal as both a workgroup solution and a solution in some high-end scenarios, such as Web server farms and enterprise applications. Let's look at some of the NAS options.

On the workgroup side, several different appliances that are available offer workgroup file and print capabilities. Their functionality usually includes Unix Network File System (NFS), Windows SMB (now called CIFS), Macintosh, and NetWare file serving.

These NAS devices are designed to be set up quickly and maintained easily. This is accomplished by eliminating the hardware and software that is required by a traditional server, which needs to perform many tasks in addition to file and print services.

NAS file-serving devices can be deployed throughout an organization to push file services for workgroups down to the workgroup level. This can make it easier to manage traffic on the network and minimize the organization impact of a failure in a workgroup server.

Of course, the very problem with decentralized resources is

▷ CONTINUED ON page S8

CONTINUED FROM page S7

decentralization. It can make management a headache in larger organizations and can ultimately increase the administrative costs it was designed to reduce. In some cases, larger NAS devices might be needed, or traditional servers might be the right choice — it really depends on your unique needs.

NAS offers high-end solutions as well. These can be handy for larger organizations hoping to provide centralized workgroup file services, or for Web farm and enterprise application environments. These solutions work like low-end solutions, but they include high-performance RAID, multiple network connections, and high-speed network protocols, such as Gigabit Ethernet.

These high-end solutions can obviously handle significantly more users in a file and print environment than a workgroup NAS solution. In a Web farm environment, fast NAS solutions can make propagating content to the servers much easier. The updated content simply needs to be loaded on the NAS device, and because the servers all access the

NAS device for their data, the content is updated across the farm. Obviously, capacity planning on the network and on the NAS device is critical in ensuring that the NAS device doesn't become a giant bottleneck.

Enterprise applications hosted on multiple servers can also access data shared on a NAS device. By offloading storage from the servers, you can split storage from servers in capacity planning, which can simplify the process and provide you with more flexible configuration options.

The drawback to NAS in both the Web farm and application environment is that the network becomes a failure point between the storage and the server. In the NAS scenario you have to plan your network with the same reliability that you expect from your SCSI bus, or you have to ensure that your applications can tolerate a sudden loss of data access like you would have in a SCSI adapter, cable, or device failure.

STORAGE-AREA NETWORKS

SANs offer a storage solution decoupled completely from the server with enterprise-

class performance, high reliability, and high capacity — albeit with high price tags. In many scenarios, a SAN can provide the ultimate storage solution.

Unlike the traditional server-attached storage model, SANs connected with Fibre Channel provide shared access for servers to storage devices such as disks, tapes, and optical disks. And unlike the NAS solution SANs remove all server functionality from the storage device, leaving this functionality up to the servers and management device on the SAN.

Fibre Channel, which performs like SCSI on steroids, supports hundreds of devices connected to one Fibre Channel loop, provides blinding transfer rates, and allows multiple hosts to share access to devices on the SAN. This can simplify capacity planning and provide a great deal of configuration flexibility. SAN implementations can ensure the most efficient use of resources — such as tape libraries — by making these resources available to all the hosts on the SAN at all times.

A SAN is perfectly suited for situations in which an application (whether electronic commerce or enterprise resource planning or a large group of users needs fast, reliable and secure access to vast quantities of centrally stored data.

The downside to the SAN architecture is its maturity, or lack thereof. Serious compatibility issues must be overcome to implement a SAN in a heterogeneous environment. In addition, the software and hardware tools that will allow us to realize the full potential of the SAN architecture are years away. Finally, SANs and SAN storage-devices come with a hefty price tag. This means that your SAN strategy will have to be carefully thought out beforehand.

BOTTOM LINE

There are many options for a storage strategy, so you should be able to find a path that works for you. Keep in mind that the stakes have never been higher for a successful storage strategy, given the industry's insatiable appetite for data. By carefully planning your strategy based on your organization's unique needs — with future needs in mind — you won't see your storage dollars and effort go to waste.

How to pick the right storage strategy

Which storage strategy is right for you? There are many options and factors to take into consideration, but a few generalizations can be made.

The traditional server-attached storage model certainly won't disappear. Even as new choices become available, there are some compelling arguments for server-attached storage.

In some organizations, file and print services and applications servers can share a common platform. In this scenario, having one server platform to manage can provide the simplest solution. In addition, if capacity demands are well-understood and fairly static, they can be nailed down with a server-attached strategy.

In situations in which storage demands are changing constantly or growing explosively, the flexibility provided by network-attached storage (NAS) and storage-area network (SAN) implementations can provide a more dynamic foundation for a storage strategy than does server-attached storage.

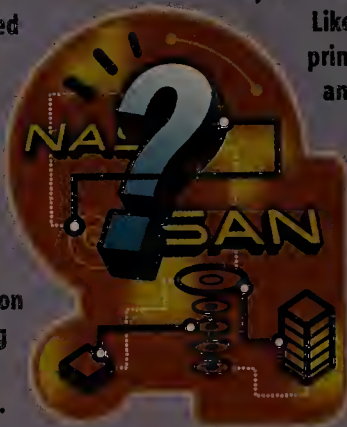
NAS solutions hold a great deal of appeal at the workgroup level. In situations in which an organization has few workgroups that need only file

and print services, in small offices that have similar needs, or in small remote offices of larger organizations, low-end NAS devices can significantly reduce administrative headaches.

Likewise, for demanding file and print applications or for Web farms and large, storage-intensive applications, higher-end NAS solutions may hold some appeal. In these scenarios, they can centralize and simplify file and print administration, provide an easily updated storage option for Web content, and provide enterprise applications with high-performance shared storage.

Many organizations are planning or implementing SAN solutions in their data-center environments. When capacity, throughput, and reliability are critical, and when storage needs are changing and capacity demands are rapidly increasing, you can't beat the dynamically reconfigurable nature of the SAN environment.

Of course, there are many factors to consider when choosing a storage strategy. Investing time and resources up front to assess your organization's needs will save you from having to rethink your strategy after your solution is in place.



STORAGE-AREA NETWORKS

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Management Strategies

Career Development, Project Management, Business Justification

A common bond

Corporate alumni associations help former colleagues stay in touch.

BY ELISABETH HORWITT

Whether you're interested in waxing nostalgic about the old days, recruiting employees or networking to advance your career, corporate alumni associations offer a golden opportunity.

As job hopping becomes increasingly commonplace, corporate alumni groups have sprung up to offer former colleagues a way to stay connected. The groups span a range of industries, from high-tech to finance to management consulting. Likewise, alumni organizations are highly diverse in terms of members' professions and skills.

When Carole Gunst left Lotus a few years ago, she missed the social and business network she had at the company. So in 1997, Gunst and two of her friends founded the Association of Ex Lotus employees (AXLE) and set up an electronic Rolodex on an old PC with a dial-up connection. "We thought it would be useful for us and a lot of other people," she says.

They were right. AXLE is now 1,525 members strong, and the group's Web site offers a member directory, job postings, discussion area, events calendar and an online newsletter. The site has become a sort of job clearinghouse for former Lotus employees.

Like AXLE, many alumni groups were started by former employees, not the parent company. Big Blue Alumni International (BBAI), for example, was formed in 1993 when 93,000 IBM employees took part in a largely voluntary downsizing.

"It made sense to me that we should stay connected electronically," says Linda Anderson, a BBAI co-founder who manages its Web site through her company, Advanced Web Systems in Fort Worth, Texas.

Yet some companies like to be involved with the alumni groups they spawned, particularly in the service industry.

When someone leaves an accounting or management consulting firm, the employer hopes someday to rehire the worker or that the person will refer business his new firm doesn't handle, says Glenn Kaufman, founder of Boston-based Corporate Alumni, which manages alumni Web sites like AXLE's. Organizing an alumni group and hosting its

Web site becomes a handy way for the parent company to keep track of these valuable human resources.

The Boston Consulting Group (BCG), for example, manages its alumni organization of some 3,000 members and maintains its Web site as part of BCG.com. "Our alumni network is very strong," says Kate Gilliatt, manager of alumni relations at BCG. "Our CEO has a real philosophy that joining BCG is a lifelong bond. Many of our alumni are clients, as well."

Former employees of high-tech firms and IT professionals in particular are prime targets for the recruiters who hang around alumni Web sites, Corporate Alumni's Kaufman says. Indeed, a number of headhunters have contacted former Lotus employees through AXLE's Web site and electronic directory, which are open to the public. "Most people are thrilled to be called. We only had one person ask to have his name taken off," Kaufman says.

"Alumni parties are really heavy places for job networking," says Susan Cabral, general secretary for J.P. Morgan's alumni association. But reunions have one drawback: They only happen a few times a year.

Alumni Web sites let members network in a more ongoing and dynamic fashion. And while printed directories are often out of date before they're even published, Web-based directory databases let alumni update their profiles online as needed.

Of course, not all alumni are jumping onto the Web. For example, only about 8,000 to 10,000 out of a total of 200,000 IBM alumni use BBAI's Web site. "We'd hoped for a lot more," Anderson says. She ascribes the low usage mainly to BBAI's large number of retirees, who are less likely to be Web-literate or to access the site for business networking.

And some alumni worry that putting their names, e-mail addresses and job histories on the Web will leave them open to spamming and other intrusions.

"We were loath to put the directory online



Kate Gilliatt of The Boston Consulting Group wants to keep former employees close to the company.

because people might get harassed," J.P. Morgan alumna Cabral says. "We don't have the energy to figure out a password system." The association sends out a hard copy directory, while members who wish to be contacted are free to post their e-mail addresses on the organization's Web site.

Other alumni associations have addressed the problem with security measures. BCG, for example, assigns unique user names and passwords so it can track activity.

"So far, we've had no problems," Gilliatt says. And BBAI helps ensure its members' privacy by password-protecting message forums.

The ability to have a cozy conversation or trade job tips within a virtual community of former colleagues is perhaps the most valuable thing alumni organizations and their Web sites have to offer members.

And sometimes, what alumni organizations provide for their members is something as simple as the chance to relive a good memory.

"I've heard of people who were dying to get ahold of the J.P. Morgan recipe for Mulligatawny soup," Cabral says.

Horwitt is a freelance writer and consultant in Waban, Mass. She can be reached at EHorwitt@compuserve.com.

More Online

- Drop by a few corporate alumni sites to see what they have to offer.
- Read an article to find out why rehiring former IT workers is good for business and corporate morale.
- Visit our Career Doctor, who is on call to dispense job-related advice.

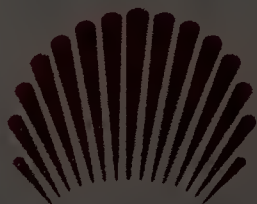


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MOTOROLA EMBEDDED SOLUTIONS

Editorial

U.S. Dept. of Justice vs. Microsoft: The real story

In the end, it came down to four simple letters — APIs. According to Judge Thomas Penfield Jackson, Microsoft abused its monopoly again and again, and each time it was to protect its precious Windows APIs.

The reports in the general press have for the most part failed to mention APIs. Maybe it's because the writers don't understand APIs, or they realize their audience won't understand or care about APIs, or maybe they simply failed to read the judge's complete ruling.

Well, I read all 207 damning pages, and I'm here to boil it down so you don't have to. Actually, the document is fine reading. Jackson is no Hemingway, but his decision is a crisp and cogent history and analysis of Microsoft's business practices over the past decade.

In the end, Jackson found that:

- Microsoft contracts with PC vendors called for the manufacturers to stop distributing IBM's OS/2, which offered an alternative API set.
- Microsoft forced Intel to abandon multimedia APIs that directly exploit Intel chips.
- Microsoft tried to squash Apple's Quicktime APIs, which offered Windows developers a cool way to write video applications.
- Microsoft tried to convince Netscape to stay away from the Windows 95 market. When it couldn't control Navigator, which offered an alternative API set for developers, Microsoft decided to kill it.
- Microsoft tried to turn Java APIs into Windows APIs, and largely succeeded.

Of the 412 findings, Microsoft agreed with just one: that Internet Explorer "gave Netscape an incentive to improve Navigator's quality at a competitive rate."

Ironically, Microsoft didn't have to be so paranoid about the APIs. Software developers love an operating system monopoly because they only have to write to one thing. The Windows monopoly, in my estimation, could have preserved itself quite easily without all the arm twisting and crazy contracts.

What should be done? It's too late to undo the damage to competitors. However, Microsoft should be carefully restricted in how it writes contracts, should totally separate its application and operating system businesses, and should be forced to give loads of stock options to all it has harmed.

— Doug Barney
Executive Editor, News
dbarney@nw.com

Message Queue

POLL POSITION

In his recent "Net Buzz" column, Paul McNamara makes some valid criticisms of online polling ("Let's see a show of hands," Oct. 11, page 90). While I agree that, used carelessly, these polls can be misleading, I also believe that McNamara is ignoring the real benefits polls have in certain common situations.

According to e-buyersguide.com, 32% of online retailers currently capture customer feedback. In the .com world, online surveys, polls and any other measures of consumer satisfaction are invaluable to the site manager in measuring return on investment.

In sites such as Deja and iVillage, where members' opinions are a substantial part of the site's content, polls, rankings and surveys are excellent additions to the information on the site.

Finally, and obviously, on company portals and intranets, where the audience is the networked workforce, polls and surveys are as fundamental to management as the brick-and-mortar suggestion box.

Camilo Wilson
CEO
Cogix
San Anselmo, Calif.

NEW MEDIUM FOR NEW AGE

I enjoyed your Management Strategies piece "E-commerce experts" (Oct. 25, page 69), which discussed Internet-related certification programs. It is about time that someone finally addressed the real issues underlying electronic commerce.

Slapping a credit card interface on a Web site and calling it e-commerce is like calling 1950s TV interactive multimedia. One cannot do business in a transnational medium by relying on provincial, half-century-old technologies.

Certification programs will have to compete with one another to stay current with cutting-edge trends and will provide central dissemination points for cost-slashing technologies like e-gold,

Send letters to mnnews@nw.com or John Dix, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

More
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- Letters about customer service — or the lack thereof.

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micropayments and real-time delivery. I applaud HyCurve's efforts to professionalize this field.

Charles Evans
Executive vice president,
business development
Gold & Silver Reserve
Wilmington, Del.

VLANs ARE BACK

Your article "Are VLANs on the comeback trail?" (Oct. 25, page 1) was right on the mark. Virtual LANs are back and here to stay. Unmentioned in the article are authenticated VLANs, which enable security right down to the port on the wall. With firewalls clearly accepted as security for choke points such as Internet connections and remote access products, the next great challenge for security engineers is to lock down the LAN. Authenticated VLANs are here to help meet that challenge.

Ray Stratton
Systems engineer
Alcatel Internetworking Division
Lisle, Ill.

QUIT WHINING

I thought Daniel Briere and Christine Heckart's column "Looking Beyond Nose Rings & Purple Hair" (Sept. 13, page 46) was thought-provoking and brought to light a subject to which I normally would not pay attention.

My problem is with the avalanche of whining and woe-is-me tales we, as readers, have had to endure following the article ("Add sexism to ageism," Oct. 11, page 54; "Not a booth babe," Oct. 25, page 54).

This industry is based on what you can do, not what you have done. Those who do not keep up stagnate and are no good to anyone.

If all of you wise old gurus out there are unhappy with where you're at, quit. Otherwise, clam up and let the next generation have its due.

Anthony McIntyre
Network administrator
DTK Computer
Pittsburgh

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THE FUTURE OF THE INTERNET, PART II

In my last column, I opined that sometime within the next two years large parts of the Internet will be forced to switch to a metered, pay-for-play revenue model, as opposed to the flat-rate access model we use now. I received so many thoughtful and interesting responses I thought I would share some of them with you.

First, I was flabbergasted at the number of readers who agreed with me. I was further stunned by the fact that most of these readers are business users who would see their bills rise sharply if the new model were adopted. Several wrote telling me that they are already using a metered model for billing clients whose Web sites they host. Others suggested splitting the cost between sender and receiver, thus encouraging folks to keep their sites "graphics light" if they want to keep costs low.

Still others took a more traditionalist approach. One reader reproached me for advocating a more strongly centralized control structure, noting "lack of a strong structure allows innovative solutions to be rolled out quickly." Of course, all those innovative and

largely incompatible solutions also contribute to the Internet's lack of stability.

One supporting point I didn't include in the original column due to space constraints is that the U.S. government and its various agencies want a centralized, controllable and potentially taxable Internet very badly. Congress, under the banner of protecting children from harmful material, may very well introduce legislation that would mandate this fundamental shift in philosophy. We'll ignore for the moment the fact that the Internet is an international phenomenon, and we can't legislate beyond our own borders.

Other readers suggested an approach that could lead to a Balkanization effect on the network. In essence, users would split into three groups: business users who pay by the cell, home users who pay a flat rate each month and educational users who pay by using tax money from the first two groups. These groups would eventually end up on separate but interconnected networks as providers struggle to keep costs down. It might work, but the approach would result in higher home user bills because ISPs would

have to charge the average of usage, not a minimum.

My favorite reader suggestion was for content providers to pay their way by adding more advertising to their pages. Obviously this reader has an ad-blocker program and isn't worried about the effects of additional advertising on network traffic and our collective sanity.

The best comment I received came from a friend who read my column online and said, "Dang! That's gonna make CU-SeeMe really expensive!" And he's right. I use this videoconferencing program extensively, and a 20-minute session could result in 15M bytes of traffic charged to my account. Other video- and sound-intensive programs would be similarly affected. Is this the price we would pay for added stability?

Next column: IT management techniques. Are you using your time effectively? Are you managing your employees' time as well as you do your own?

Shapiro is district technology coordinator for Kingsport City Schools in Tennessee. He can be reached at jshapiro@kpt.k12.tn.us.

WHAT SBC'S DSL ANNOUNCEMENT REALLY MEANS

SBC Communications recently announced that it will be investing \$6 billion to enhance the delivery of broadband services throughout its service region. This move was widely reported as SBC spending \$6 billion on digital subscriber line (DSL) or Internet access. In truth, that's not what was announced at all, and what's really going to happen may have more impact on businesses than on residential Internet users.



The modernization SBC proposes involves spending \$1.5 billion on improved trunking facilities, the connections between switching sites. The goal is to improve the handling of packet services, particularly those based on IP. The remaining

\$4.5 billion will be spent on what service providers call "outside plant," the gear from your phone connection block inward to the carrier's serving office. This outside plant will be optimized through the introduction of new devices that SBC calls "neighborhood gateways."

Neighborhood gateways support xDSL copper attachments, which could be used for residential Internet access. But does this mean that SBC just plunked down \$6 billion on DSL-to-the-Internet? If so, SBC is blind to market reality. The company's regulated business — the one buying all this xDSL stuff — will have to provide equal access to other ISPs. Even if SBC were planning to get into the Internet on a huge scale, it couldn't limit its xDSL customers to its own Internet offering.

So is SBC expecting to get a huge return on its

\$6 billion from selling access to the Internet only? That's what the Covads and Northpoints do now, and none of them seem to be topping Wall Street charts in revenue. There's got to be more to this, folks.

One of the real justifications for SBC's move is the fact that fiber-based neighborhood gateways limit the regional Bell operating companies' wholesale risk by reducing the number of copper loops that run all the way from the customer to the central office. With the neighborhood gateway in the path, there's no continuous copper for Covad, Northpoint and others to exploit with collocated DSL access multiplexers in the central office.

The second justification is the business user. It's more likely that SBC's digital broadband changes will empower the 5.5 million business sites that don't have T-1 or better services today. It probably also will help the 1.5 million more-or-less-permanent telecommuters. This raises the question of what SBC would expect to sell to these businesses. Not just Internet access, clearly, so what else?

Voice, the generator of 80% of today's total domestic service provider revenue, is one answer, but that again raises the issue of how new voice services might look in terms of real features. SBC's digital infrastructure will be available for wholesaling to competitors. So if competitive local exchange carriers figure out how to create a kind of business "super-Centrex" service set, they could force SBC to respond with its own new-generation voice feature offering. Good news to the new-generation voice players, at least those that have ATM capability.

IP virtual private networks (VPN) have to be the other major service opportunity. Given an ATM

access network, the IP VPN service goal elevates the "how to link ATM to IP" issue significantly. That may favor vendors that have announced support for the IETF's Multi-protocol Label Switching standard that, among other things, helps to link the two competing network technologies.

Linking legacy services to an ATM access network is also going to break new ground. The major inter-exchange carriers (IXC), which all based their new-generation integrated-access services on ATM, obviously knew this was going to happen all along. Maybe SBC's move and the inevitable comparable steps from the other RBOCs will jump-start even Sprint's troubled Integrated On-demand Network.

These IXC offerings only go through the ATM access network to get to the customer. What if the customer wants integrated services and not just integrated access? Will ATM access pull ATM transport networks along just to make the connection more efficient? If so, Williams Communications' decision to base its network on ATM looks really smart.

SBC can make its new access infrastructure pay for itself on business. So what about the Internet? Well, with the return on its \$6 billion guaranteed by business, perhaps SBC will create a test bed of broadband residential users that can be used to explore what people really will be willing to pay for good Internet service — from SBC, of course. If well-heeled power-Webnicks respond to upscale Internet offerings, SBC might even make the Internet profitable.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.



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HERE'S TO THE BEST!



In this, our first annual Best Issue, we present you with the best of the networked world,

from products to management practices and more.

On the product front, you'll learn what products scored the best among members of the Network World Test Alliance and rated highest among readers polled in our best products survey. I won't divulge what products the readers liked the most — you'll have to turn to page 82 to find those — but I will say we were surprised by some of your preferences!

You'll also get a look at eight network products that our columnists consider real category-breakers. Read about their selections, beginning on page 87, for a look at innovation at its best.

On the management front, we gathered insights from leading career experts, top-notch consultants and respected network executives to help devise a best practices playbook for you. We also examine some of the best ways to attract the attention of much sought-after IT employees and how to get in tight with corporate business folks. If becoming a better — I mean the best possible — manager is one of your career goals, you won't want to miss these features.

Also, be sure to check out the companies that won top honors in our 1999 User Excellence Award competition. Beginning on page 98, we showcase the network projects of winner Olsten Staffing Services and runners-up Western Heights, a school district in Oklahoma City, and Trottner-McJunkin, a U.S.-Mexican joint distributor of industrial products. These profiles provide great examples of how network technology can be put to use creatively or to achieve business objectives effectively.

All in all, we think this is a great compilation of the best of everything in networking. Cheers!

Beth Schultz
Executive editor, Signature Series
bschultz@nww.com

THE SIGNATURE SERIES

The Best Issue is one of six bimonthly special supplements providing insights, opinions and information on the biggest trends shaping the networked world. Look for our take on the most powerful people and companies in networking in the next Signature Series installment, The Power Issue, coming Dec. 27.

THE *Signature* SERIES

BEST

BEST ONLINE

Visit our special Network World Fusion minisite (www.nwfusion.com/best) for more Best material. You'll get:

Career advice. Our own Career Doctor Shaun Kelly and Career Advisor Tom Whitley are standing by this week to field your questions. They'll give you a double dose of advice on your best course of action for turning lackluster management techniques into best of breed practices.

DocFinder: 5540

A chance to vent. We tell you the best, you tell us the worst. In this special forum, you can blast off about products that are truly overrated, tell us about your network project nightmares or share tales of employee management hassles.

DocFinder: 5541

The Best Innovations quiz. Today's enterprise networks have been shaped by some of these best ever ideas in the industry. Can you give credit where it's due? With this quiz, see if you can match the technology to the company and person most responsible for creating it.

DocFinder: 5542

MORE BEST STORIES

The best vendor Web sites. We've got an inside look at what you need from a vendor Web site. We've coupled the results of our first Best Vendor Web Site Survey with a tour of three sites conducted by Web usability firm Customer Insites. Come see what's right and wrong with network vendors' services on the Web.

DocFinder: 5543

The best jokes on the Internet. These are guaranteed to generate some giggles, if not out right guffaws. Or maybe they'll just make your eyes roll. Come see the best network related jokes the Internet has to offer. **DocFinder: 5544**



Andrew Stratford, CMA president

66 GREAT PLAYS

Best practices for network executives.



71 BEST OF THE TESTS

Get the skinny on the products that tested best this year.



82 USER FAVORITES

A survey of *Network World* readers shows an affinity for IBM products and services.

This IBM Enterprise Storage Server was very popular.



Motley Fool's Dwight Gibbs

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Network World columnists give us the scoop on category breaking products and technologies.



93 ATTRACTING THE BEST TALENT

Creativity is key when it comes to luring potential IT employees.



98 TOP-NOTCH NETWORK OVERHAUL

Olsten Staffing Services soars to new heights in customer service thanks to major infrastructure and application projects.



Superintendent Joe Kitchens

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The Western Heights School District teaches us about unified networks.



Lisa McClain, network manager

109 PERFECT FIT

Trottner McJunkin goes the distance with voice over frame relay.



115 BATTING 1000 WITH BUSINESS MANAGERS

Five tips for making sure business managers consider you part of the team.



120 THE BEST OF THE BEST

Yankee Group President Howard Anderson tells us what makes a product great.





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Great plays

Best practices for network executives. by Julie Bort

Like a playbook that turns good football great, a list of best practices can make an effective network executive even better. We've gathered ideas from leading users and industry advisors on career development, management techniques and technology choices to compile just such a list — a network executive playbook, if you will.

Do it yourself, advises Andrew Stratford, president of the Communications Managers Association (CMA) and vice president of communications for Congress Financial Corp. in New York. The best way to manage employees is to understand exactly what their jobs entail and to respect them for it. "I treat people with the respect that I expect back, and I get tremendous cooperation in return," he explains.

Note that respect means more than just good manners. It's treating employees' tasks as though they are as important as your own, and the best way to do that is to experience the job first-hand.

"I've been involved in everything — accounts payable, purchasing, installation — no job is too big or too small for me to do myself. Even if someone wants a phone plugged in, I'll do it," Stratford says.

On the other hand, don't confuse a "can-do" attitude with an inability to delegate. As Charles DeGaulle once said, "The graveyards are full of indispensable men." While the best network executives understand every person's job, they don't try to do everyone's job.

Build loyalty by encouraging staff members to learn multiple disciplines, advises Rich Glasberg, director of data communication for the Commonwealth of Massachusetts. Technology means change. Technical employees know their careers depend on keeping abreast. But the best managers realize that new skills are also a fount of job satisfaction.

"My job is to understand when employees are challenged and when they are not. A lot of people won't tell you when they're not. The first you hear of it is when they resign. Technology keeps people challenged," Glasberg says.

Training isn't enough. The best managers encourage employees to apply what they've learned by spearheading new projects.

"Avoid pegging people in a hole and making them work all the time on what they know," he says. It's an easy trap to fall into, giving ever more database projects to the database expert. But instead, let the database expert run, say, a Java project. Not only will most technical employees stay longer if they can continue to learn new tricks, but you'll also benefit from having a cross-trained staff.

Also, think outside the technical box when challenging employees. Management responsibilities are another motivating source. Encourage staff members to grow business smarts along with technical know-how. This helps create loyalty while giving you more choices for promotions.



Dabble in different areas of networking, advises Andrew Stratford, president of the Communications Managers Association.

Organize your department for today's networked economy, advises Ken McGee, vice president and a research fellow for Gartner Group in Stamford, Conn. "Most organizations are still using a 30- to 40-year-old organizational structure based on voice and data technology silos."

Such an organizational chart resembles a Level 1, 2, 3 hierarchy in which problems are escalated up the chain of command. This is a trap because it forces employees to spend most of their time fighting technical fires. That means new projects take a back seat to keeping the network running. "In this kind of organization, when you ask someone what his biggest complaint is, you hear, 'I can't work on anything because I'm constantly stopped to help fix stuff,'" McGee says.

While that's been a complaint of network staff since networks were invented, the situation has reached a critical juncture, thanks to e-business. As more businesses rely on the Internet, and consequently the network, for revenue streams and cost-cutting measures, the gauntlet is thrown. Engage in e-business and all the associated cost-benefits, or watch profits trickle away to those who do.

If everyone in your department is on fix-it duty, who is going to develop your electronic commerce systems? Or once those basic systems are installed, who is going to supplement them with new capabilities?

New projects should be equal to maintenance. One good way to do that is to dedicate people to tasks, not technologies. For instance, don't have the same folks that implemented the e-commerce system be responsible for maintenance once it hits production. Rather, have distinct implementation and maintenance teams.

Build relationships with numerous customers, McGee also advises. This is a sharp contrast to a network manager's former role: servicing only inter-

nal folks. But next year, "for the first time in history, at least half of the network budget will be spent outside the back office," contends McGee, citing Gartner Group research showing worldwide IT spending climbing to \$3.3 trillion by 2002, with e-business spending accounting for 50%. That means networking will no longer revolve around building physical infrastructures; it will focus on e-business.

The best network executives understand that their departments will now support new people, such as customers. A network executive must therefore build direct relationships with customers to determine what their needs are in an e-commerce system and to help formulate e-business recommendations.

"Somebody is going to do this. Why shouldn't it be the network executive giving advice on a networked economy?" McGee asks.

Likewise, e-business also means an increasing number of departments will be using the network for mission-critical work. Whereas the sales staff might have used the network for e-mail, faxing and file/print a year ago, next year it'll be using the net for Web-based sales-force automation applications. The network executive must build tighter relationships with internal customers to make sure the network is supporting their growing needs. (See related story, page 115).

Make documentation a religion, says Deke Kassabian, technical director of IS and computing network engineering at the University of Pennsylvania. Preach it from the pulpit. Staple it to doorways. Make sure that no project is signed off until the documentation is complete.

"Having good network diagrams and having documentation on all details of device configuration is hugely important. It can't just be that Bob over there knows how some router is configured," says Kassabian, who is also a Network World Test Alliance Partner.

Granted, this advice is a lot like flossing your teeth. You already know you should do it. Unfortunately, most companies never get around to doing it right or well. So when it comes to a list of best practices, this one can't be overlooked.

Improve your documentation practices by developing guidelines for who does the documentation and how it should look (Visio diagrams? Written descriptions?). Build documentation version-control policies (Who updates configuration changes and when?). Don't assign people to new projects until the documentation is done. When hiring contract workers, budget some of their hours to be spent on documentation per your policies (even if they groan about it).

Hire consultants only when your staff doesn't have time for a project, not when it doesn't have the necessary skills, says Joel Snyder, senior partner with Opus One, a networking consultant in Tucson, Ariz., and a Network World Test Alliance Partner.

"If you hire a consultant to do the work and you don't know the technology, you're not going to know it when the consultant leaves, and you're still going to have to learn it," he says.

Likewise, when a consultant is on-site, schedule a lot of quick update meetings. "When you hire someone to do a 40- to 80-hour contract, so much happens in such a short time," Snyder says.

Also be sure that the consultant is operating from a well-written scope of work. "Most people don't take the time to properly design what the consultant is to do. Then the project goes on and on with the consultant happily billing all the while," he says.

An effective scope of work details exactly what is to be done, within what time frame, in demonstrable terms. But it's tougher than it sounds. It includes enough precision to create understanding, yet is flexible enough to reflect changes mandated by Murphy's Law.

Have two or three primary vendors — no more, no less, Kassabian advises. "Vendor relationships are difficult and time-consuming. Don't have too many of them," he says. At the same time, multiple vendors are a necessity because "end-to-end promises" are still a fantasy.

True, on occasion you'll be compelled to buy a great new product. But when it comes to the building blocks of your network — routers, switches, remote access devices — stick with a select group of vendors,

Kassabian says. Put pressure on those companies to keep up with new features, rather than buying products from too many vendors.

Limiting vendors has a great trickle effect: It narrows the number of products you must test. Why put a product through its paces if it doesn't come from — or work with — products from your primary vendors?

Don't test products from young vendors. Have your staff research them, Kassabian adds. For those cool new products that seem to solve your biggest problems, do a lot of "paper research" first, he advises.

Ignore marketing materials, such as brochures, press releases and white papers. Read the manual and the specification sheets. If the product claims to support a specific protocol, have one of your network engineers brush up on the protocol, then talk to the product's engineer to determine exactly how the product complies. When reading product reviews from the media, download the tester's notes and study them. Under what conditions did the tester get those results?

Paper research will eliminate your interest in 95% of the new products out there, leaving only a handful to test each year, Kassabian says.

The exceptions are leading products in emerging categories. Have your staff get hands-on experience with these products routinely so that they understand the technology as it evolves. When products are ready for trial runs, your people will be, too.

And should a product from a new vendor pass paper muster, don't march it directly to your test lab. Call the vendor in to do that, Glasberg adds. This serves three functions. First, it helps prove the product works in your environment. Second, the vendor spends its resources implementing the test, and that should reduce the time necessary for testing because of the vendor's familiarity with the product. Third, you can more easily document a correct implementation.

Learn a wider variety of budgeting techniques, particularly zero-based budgeting, advises Richard Heally, president of CLEC Rockefeller Group Telecommunications Services in New York, and CMA board member.

Zero-based budgeting justifies costs as if they were to be expended for the first time, rather than as percentage increases over a previous budget. It begins by prioritizing expenditures. For example, a \$1.2 million line item for the Gigabit backbone may be ranked as a higher priority than other expenditures. With the zero-based budget, every penny in that \$1.2 million is represented, along with a cost/benefit justification. If money gets tight, this budget shows what gets cut and what doesn't.

Zero-based budgets force you to describe the value of your department in terms non-technology people can understand, Heally says. As torturous as it seems to justify repeatedly every penny you spend, mastering this technique makes the purse-holders understand the network bang for the buck.

The same applies to several other budgeting practices in vogue. These include activity-based budgeting and rolling forecasts. Ultimately, these financial tools help you better document needs.

Incorporate lateral moves into your career, Heally also advises. If technology is all you've ever done, you may be climbing toward the proverbial glass ceiling. "If you want to learn about a business, you've got to learn each

function. It is possible to work strategically in various departments," he says. Nothing will help you understand revenue better than working in the billing department, for instance.

If lateral moves don't seem like a direct route to a presidency, that's because they aren't, Heally asserts. "If you're willing to make your career an experience instead of a climb, you'll do better. Climbing is an illusion. The ladder is an illusion. Learning the various aspects of how a business runs is better experience than getting a series of 'management assignments.'" B.



Don't ever underestimate the importance of good documentation, advises Deke Kassabian, a technical director at the University of Pennsylvania.

Ask a career expert for advice on your business particulars. Tap into a forum with Network World Fusion Career Doctor Shaun Kelly and Career Advisor Tom Whitley.
DocFinder: 5540

www.nwfusion.com

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MCI WorldCom has an entire continuum of data services on our seamless global network. Here's how we made it work for a global investment firm.

data onto one private network. And then expanded that network by including Internet access. After all, when you've got

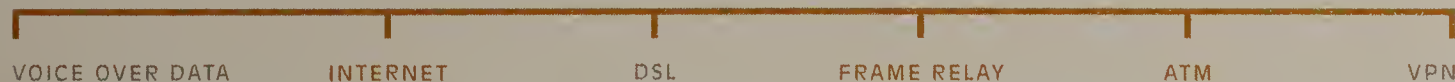
a wholly owned, seamless global network*, you can give your customers pretty much anything.

Once their systems were merged, the real fun began. We built a web site that could integrate both their

private and public networks. Thus allowing enough free flow of information to enable their online customers to do everything they used to do in person. Open accounts. Conduct trades. Or simply transfer funds.

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Expanding Possibilities

Best of the tests

Get the skinny on which products tested best this year. by Ann Sullivan

Rich, fatty cream rises to the top of its milk host, making it possible to segregate the two dairy products. If only distinguishing stellar products from average performers were that simple. But with industry hype obscuring the field, it's tough to know what works well and what doesn't. Fortunately, we do quite a bit of the legwork for you — having tested 169 products by October's end.

Here we've compiled the best of the best.

Most of the products profiled here have won a Blue Ribbon or a World Class Award. We give Blue Ribbons to the highest-scoring product in a comparative review, as long as that product earns at least a 7.5 out of 10. The loftier World Class Award goes to products that score a 9.0 or higher. And we've created a new designation — Best of the Tests, for products falling within the top 10%, by score, of all tested this year.

Exceptional servers

Dell took home World Class Awards for a workgroup and a department server, both of which combine great performance and design. Loaded with four 500-MHz Pentium III Xeon processors, the PowerEdge 6350 outpaced all the enterprise-class servers we've tested. It narrowly beat its closest competitors in the CPU and network-performance tests, but secured a comfortably wide lead in the file tests. Dell's second World Class recipient is the PowerEdge 4300, a midrange server designed for shops that plan to start small and grow.

Among the other servers we tested, Compaq's ProLiant 6500 earned an impressive 8.9 score. It supports four 450-MHz Pentium II Xeon processors and tore through our CPU performance tests. Also noteworthy is IBM's four-processor Netfinity 5500 M20. Its 8.7 score was buoyed by perfect 10s for manageability and serviceability.

Security savvy

Network security is at the top of every net manager's worry list. But it's



PRODUCT: IT DECISIONGURU, NETWORK SIMULATION TOOL

VENDOR: MIL 3

WEB SITE: WWW.MIL3.COM/PRODUCTS/ITOG/HOME.HTML

Reviewer's take: "If you want the Ferrari of simulators, this is the product to purchase."

— Bob Currier, director of data communications, Duke University, and member of the Network World Test Alliance

PRODUCT: CHARIOT, NETWORK PERFORMANCE ANALYSIS TOOL

VENDOR: GANYMEDE SOFTWARE

WEB SITE: WWW.GANYMEDE.COM/HTML/CHARIOT.HTM

Reviewer's take: "Chariot 2.2 is an invaluable kit for enterprise network managers. Its flexibility and ability to emulate applications and aggregate multiple streams into a single report make this a must have package."

— Currier, Duke University

PRODUCT: POWEREDGE 6350, WORKGROUP SERVER

VENDOR: DELL

WEB SITE: WWW.DELL.COM/PRODUCTS/POWEREDGE/PE6350

Reviewer's take: "Dell's PowerEdge 6350 is our best performing server to date, shining in every area and excelling at file serving."

— John Bass, technical director, Centennial Networking Labs at North Carolina State University, and member of the Network World Test Alliance

PRODUCT: CLEARTRUST, WEB AUTHORIZATION SERVER

VENDOR: SECURANT TECHNOLOGIES

WEB SITE: WWW.SECURANT.COM/FRAMESET_PRODUCTS.HTML

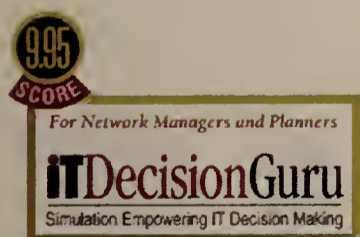
Reviewer's take: "ClearTrust stood at the top of the list for its granularity of protection. It allows you to protect specific objects in the Web site, including databases, server storage files and directories."

— Jeff Bankston, director of network services, Client/Server Labs

BEST OF THE TESTS

By score, the

following products fell within the top 10% of all those we tested, earning our Best of the Tests distinction for this year.



tough to differentiate security vendors and their wares. We know that better than anyone — we've published seven comparative reviews evaluating 43 security products so far this year.

Competition is particularly stiff in the virtual private network (VPN) market. In the spring, we tested 15 site-to-site VPNs used to connect LANs over an insecure network. All were Layer 3 products based on the IETF's IP Security (IPSec) standard. We tested the merits of standardized IPSec VPNs to see if mixing and matching vendors is really possible. Many products couldn't interoperate, but Radguard's cIPro System led the field with top-notch interoperability and top-tier speeds. We tested cIPro System 3.30; Version 4.0 is shipping now.

The firewall market continues to evolve as vendors add virus and content-scanning features and devise defensive maneuvers to protect against denial-of-service attacks. In our annual comparative review, one of the old-timers took home the Blue Ribbon: Axent Technologies' Raptor Firewall (previously known as Raptor Systems' Eagle). A well-rounded enterprise firewall, Raptor stays competitive with comprehensive security features and easy configuration. Even implementing dual Domain Name System (DNS) servers was simple in our tests.

Easier, more error-proof configuration is also a strong selling point of firewall appliances, one of the latest trends for securing branch-office environments. The appliances combine firewall security with VPN features, require a minimum of adjustments and often include Internet-based services such as mail and Web browsing.

Check Point Software's VPN-1 Appliance won the Blue Ribbon in our comparative review of all-in-one security appliances. VPN-1 Appliance lets you define a single integrated security policy that can be distributed across multiple firewall gateways from a central location. It's the only appliance product we tested that lets you verify your policy set to find inconsistencies or overlapping rules. We reviewed Version 4.0; a new version is due out before year-end.

If you're interested in the added comfort of token-based security, consider Vasco Data Security's Vacman/Server. Interoperability keeps

Vacman/Server easy to integrate and manage in your network; the product's Proxy Manager lets it interoperate with almost any firewall and VPN. Vasco's feature-rich Digipass 300 — the server's hardware token counterpart — was the only token we tested that supports the Triple-Data Encryption Standard and optical data entry. We tested Version 3.0. Vasco is currently shipping Vacman Radius Server 4.5 and the Vacman Programmer 1.0 token initialization product.

As e-commerce takes off, Web site security has become more important than ever. We tested four Web authorization servers designed to lock down your site. Among the access controls these servers provide are single sign-on to multiple networked resources and authenticated access to an e-commerce database. Securant Technologies' ClearTrust emerged as the best in its class, earning a World Class Award for its manageability and extensive authentication options. Netegrity's SiteMinder also scored a World Class Award, thanks to a great user interface and solid authentication protection.

Yet having all the hardware and software in place to protect your network from unauthorized access still doesn't mean you can sleep nights without worry. What if a breach occurs?

Security monitoring and scanning software can provide the backup assurance you need by identifying server vulnerabilities and suspicious user activities, and suggesting corrective actions. The best we tested is BindView Development's Network Security Suite, which won World Class designation. It comprises HackerShield for network scanning and, for server security, NOSadmin for Windows NT.

HackerShield continuously scans for security violations. In our tests, it caught an unauthorized access to a payroll database and told us what ports and protocols were used to get to the host. The RapidFire module updates HackerShield through BindView's Web site as new security threats are discovered and fixes are implemented.

Placing just behind BindView's suite was Computer Associates' eTrust Intrusion Protection (known as SessionWall-3 when it was sold by Platinum Technologies and AbirNet). ETrust's analysis features exceeded all others;

Continued on page 74

PRODUCT: POWEREDGE 4300,
DEPARTMENTAL SERVER

VENDOR: DELL

WEB SITE: WWW.DELL.COM/PRODUCTS/
POWEREDGE/PE4300

Reviewer's take: "The PowerEdge 4300 is a good value with lots of room inside for future hardware expansion."

— Bass, North Carolina State University

PRODUCT: SITEMINDER, WEB
AUTHORIZATION SERVER

VENDOR: NETEGITY

WEB SITE: WWW.NETEGITY.COM/
PRODUCT/

Reviewer's take: "SiteMinder makes good use of policies and rules to keep unwanted visitors out, and reported the intrusion attempts when we attempted to hack into the protected Web site."

— Bankston, Client/Server Labs

PRODUCT: BLACKICE AND ICECAP,
INTRUSION-DETECTION
SOFTWARE

VENDOR: NETWORK ICE

WEB SITE: WWW.NETWORKICE.COM/
PRODUCTS/DEFAULT.HTM

Reviewer's take: "... for shops that don't have and can't afford resident security experts, we recommend Network ICE's BlackICE and ICEcap. They're as close to a security consultant in a box as we've seen."

— Tere Parnell, telecommunications consultant and member of the Network World Test Alliance

PRODUCT: NETWORK SECURITY SUITE,
SECURITY MONITORING AND
SCANNING SOFTWARE

VENDOR: BINDVIEW DEVELOPMENT

WEB SITE: WWW.BINDVIEW.COM

Reviewer's take: "HackerShield is the network scanning portion of BindView's suite, while NOSadmin concentrates on server security. Together the two products create a thorough, flexible and easy to use security monitoring and management package."

— Parnell, telecommunications consultant

PRODUCT: DELAND E-BUSINESS INTER-
ACTION SUITE, E-MAIL
AUTOMATION SOFTWARE

VENDOR: DELANO TECHNOLOGY

WEB SITE: WWW.DELANOTECH.COM/
PRODUCTS/INDEX.ASP

Reviewer's take: "Delano's product brings together Web and e mail applications in a simple and powerful package."

— Thomas Powell, founder and president of PINT, a Web development firm



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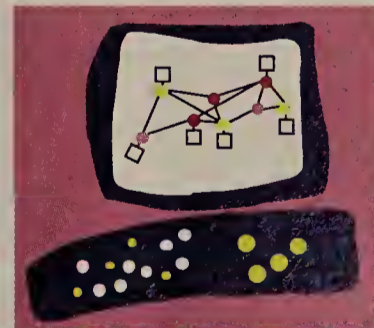
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Continued from page 72

the product can actually capture packets and present them in their original formats so net managers can read e-mail or Web pages accessed by users.

Intrusion-detection products pick up where security monitoring and alerting tools leave off. They identify a network breach, stop the attack and even track down the offender. In our tests of four intrusion-detection products, the BlackICE and ICEcap duo from Network ICE earned a World Class Award. Using a pool of agents, BlackICE locates the intruders; ICEcap is the management module that gathers and analyzes information collected by agents to spot wide-scale attacks.

Axent's Intruder Alert also earned a spot among the top scoring products for its sophisticated policy management and extensive protection capabilities.

Performance enhancers

Who wouldn't like to squeeze a few hundred more packets across an existing infrastructure? Network monitoring and design tools can help you improve network performance and predict the effect new applications will have on performance.

For day-to-day monitoring, we tested software that watches the health and availability of networked devices, alerts you to any malfunction and, in some cases, solves problems. Of the six programs we tested, MediaHouse Software's Enterprise Monitor has the strongest monitoring features, and its notification options are plentiful. It can send outage alerts by pager, e-mail and pop-up boxes, and it can produce reports that help establish baselines and identify trends. Corrective features include the ability to reboot a machine running Windows NT.

WORLD CLASS AWARD WINNERS

Here's a recap of the products that have earned World Class designations this year.

- BindView Development's Network Security Suite
- Delano Technology's Delano e-Business Interaction Suite
- Dell's PowerEdge 4300
- Dell's PowerEdge 6350
- Ganymede Software's Chariot
- MIL 3's IT DecisionGuru
- Netegrity's SiteMinder
- Network ICE's BlackICE and ICEcap
- Securant Technologies' ClearTrust

You can get more sophisticated network performance analysis with Ganymede Software's Chariot, a software tool for stress-testing network hardware and modeling the behavior of new applications prior to deployment. With World Class accuracy, Chariot zeroes in on the source of a problem using Network Performance Endpoints (NPE) installed on each machine. While we tested Version 2.2, Ganymede is now shipping Version 3.1, which includes support for measuring jitter and an API. The next new version is due out in the first quarter of 2000.

A World Class Award winner and our top scorer for the year, IT DecisionGuru from MIL 3 specializes in network simulation. With IT DecisionGuru, you can build a model of your network devices and protocols, and test-drive

network designs. Flexible drawing tools let you modify the attributes of MIL 3's node and link models to construct your network model accurately. Then IT DecisionGuru predicts network activity and application performance using a combination of packet-by-packet traffic analysis and mathematical equations, making it easier to allocate bandwidth and avoid potential overloads.

Another useful tool for network architects is diagramming and autodiscovery software. Visio's Visio Enterprise 5.0 can scan your network, determine its topology and depict it graphically. Comprehensive drawing features, an enormous device library, and excellent import and export capabilities secured Visio Enterprise 5.0 a Blue Ribbon.

In the field, quality of service (QoS) is a performance-enhancing technique built into many of today's switches. AppSwitch 2500 from Top Layer Networks is one of the newest switches equipped with QoS, and this particular 10/100M bit/sec Ethernet switch earned our respect with wire-

Continued on page 76

PRODUCT: AELITA ENTERPRISE SUITE, WINDOWS NT MANAGEMENT SOFTWARE

VENOOR: AELITA SOFTWARE GROUP

WEB SITE: WWW.AELITA.COM/PRODUCTS/COMPONENT.HTM

Reviewer's take: "With a complete set of migration utilities and the ability to back out of any part of the process of moving NT domains to Windows 2000 Active Directory, Aelita's Enterprise Suite captured our Blue Ribbon Award." — Dennis Williams, network administrator, consultant, writer and member of the Network World Test Alliance

PRODUCT: NFS MAESTRO GATEWAY, NFS GATEWAY

VENOOR: HUMMINGBIRD COMMUNICATIONS

WEB SITE: WWW.HUMMINGBIRD.COM/PRODUCTS/NC/NFS/INOEX.HTML

Reviewer's take: "For making the most of Network Integration Service and offering cutting edge support for WebNFS, NFS Maestro wins our Blue Ribbon Award." — Parnell, telecommunications consultant

PRODUCT: COMPAQ PROLIANT 6500, ENTERPRISE SERVER

VENOOR: COMPAQ

WEB SITE: WWW.COMPAQ.COM/PRODUCTS/SERVERS/PROLIANT6500-XEON/INOEX2.HTML

Reviewer's take: "The ProLiant 6500 packs a lot of power and features in a small, easily serviced package." — Bass, North Carolina State University

PRODUCT: ETRUST, INTRUSION-DETECTION AND SECURITY MONITORING SOFTWARE

VENOOR: COMPUTER ASSOCIATES

WEB SITE: WWW.PLATINUM.COM/PRODUCTS/SYSMAN/SECURITY/SESSW_PS.HTM

Reviewer's take: "The newly christened eTrust delivers competitive monitoring and analysis features and strong reporting options." — Parnell, telecommunications consultant

PRODUCT: FIRSTCLASS INTRANET SERVER

VENOOR: MC2 LEARNING SYSTEMS (FORMERLY SOFTARC)

WEB SITE: WWW.BUSINESS.SOFTARC.COM/WORKS/

Reviewer's take: "In short, we were impressed. FirstClass Intranet Server is good looking and well featured, and the system's overall performance is excellent." — Mark Gibbs, contributing editor and member of the Network World Test Alliance



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BigIron 8000

Switch & Switching Router



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speed performance, Layer 7 QoS and application-specific firewall features. Though it didn't earn an award, AppSwitch 2500's score of 8.7 makes it a best of the tests.

Web site maintenance

If your business depends on a functional, user-friendly Web site, make sure you've got the best tools in place to administer your site, manage peak traffic, conduct secure exchanges and keep track of who's visiting.

We tested eight Web servers early this year, and iPlanet Web Server from the Sun-Netscape Alliance (previously Netscape's Enterprise Server) came out on top for its easy installation, simple administration and basic reporting features. A beta version of Lotus' Domino server placed a close second and, when we tested the full version that shipped this spring, it earned a solid 8.7.

When high traffic threatens Web server's performance, load balancers distribute visitor requests to multiple Web servers based on traffic volume and server availability. Resonate's Central Dispatch topped eight other load balancers, providing the strongest performance of the lot, easy installation and good management features.

If you're ambitious enough to build your own Internet store, you'll need an e-commerce application that can deliver fast, secure

BLUE RIBBON AWARD WINNERS

Here's a recap of the products that have earned Blue Ribbon designations this year.

- Aelita Software Group's Aelita Enterprise Suite
- Axent Technologies' Raptor Firewall
- Check Point Software's VPN-1 Appliance
- Hummingbird Communications' NFS Maestro Gateway
- LANovation's PictureTaker Enterprise Edition
- Lucent's Max 6000
- MC2 Learning Systems' FirstClass Intranet Server
- MediaHouse Software's Enterprise Monitor
- Microsoft's Site Server Commerce Edition
- Mirapoint's M1000
- Mustang Software's Internet Message Center
- Network Telesystems' Shadow IPS
- Radguard's clPro System
- Resonate's Central Dispatch
- Sassafras Software's KeyServer
- Sterling Commerce's Connect:Manage
- Sun-Netscape Alliance's iPlanet Web Server
- Vasco Data Security's Vacman/Server
- Veritas Software's Veritas WinLAND
- Visio's Visio Enterprise
- WebTrends' WebTrends Log Analyzer

transactions. In our tests of five e-commerce products, Microsoft's Site Server Commerce Edition took home the Blue Ribbon for its ease of use, comprehensive features and strong third-party support. It's a complex product, but it gets the job done.

Another Blue Ribbon winner in the general Web category is WebTrends' WebTrends Log Analyzer, which generates site usage statistics culled from Web server log files. The powerful Log Analyzer is simple to use and doesn't require much attention. Schedulers retrieve log files, analyze data, and prepare and distribute reports.

E-mail assistance

Bogged down by e-mail? Three award-winning products can take some of the pressure off your network and your co-workers.

The first is Mirapoint's M1000 messaging server, designed for large shops that need a single e-mail workhorse to receive and route Internet and interoffice e-mail. We were impressed with its fault tolerance, security and features, including a filter that lets you reject messages from blacklisted domains.

If the volume of incoming mail is more than your customer service representatives can handle, an e-mail automation product can assume some of the load. Mustang Software's Internet Message Center topped two competitors in our

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PRODUCT: INTRUDER ALERT, INTRUSION-DETECTION SOFTWARE

VENDOR: AXENT TECHNOLOGIES

WEB SITE: WWW.AXENT.COM/PRODUCT/SMSBU/ITA/ITA1.HTM

Reviewer's take: "Intruder Alert is like a toolbox for security experts, with great flexibility in designing network security policies."
— Parnell, telecommunications consultant

PRODUCT: APPSWITCH 2500

VENDOR: TOP LAYER NETWORKS

WEB SITE: WWW.TOPLAYER.COM

Reviewer's take: "The AppSwitch 2500 can achieve wire speed performance while handling Layer 2 and 3 bridging and routing functions. The switch's firewall services worked as advertised, and we were impressed with its ability to prioritize the flow of network traffic by application."
— Bass, North Carolina State University

PRODUCT: NETFINITY 5500 M20, SERVER

VENDOR: IBM

WEB SITE: COMMERCE.WWW.IBM.COM

Reviewer's take: "The cost effective IBM Netfinity 5500 M20 offers an impressive list of serviceability and availability features. This server is an easy launch into the world of enterprise computing, in which uptime and minimal fix time are high priorities."
— Bass, North Carolina State University

PRODUCT: VPN-1 APPLIANCE, ALL-IN-ONE SECURITY APPLIANCE

VENDOR: CHECK POINT SOFTWARE

WEB SITE: WWW.CHECKPOINT.COM/PRODUCTS/VPN1/APPLIANCES.HTML

Reviewer's take: "VPN 1 Appliance gets the job done with strong security features and a simple approach to deploying and managing site to site VPNs."
— Gail James, founder of LANQuest Labs and member of the Network World Test Alliance

PRODUCT: NOTES/DOMINO RELEASE 5, WEB PLATFORM

VENDOR: LOTUS

WEB SITE: WWW.LOTUS.COM/HOME/NSF/WELCOME/R5HOME

Reviewer's take: "Release 5 of Lotus' Notes/Domino ... is more robust and adheres to more open standards than previous versions. It serves many purposes, from secure Web transaction server to main knowledge management tool for large enterprises." — Steven Goldberg, contributing editor



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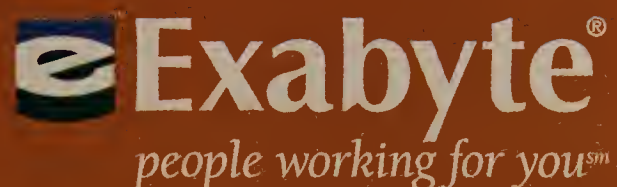
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Continued from page 76

tests. It routes and tracks messages sent to a general corporate address, such as info@yourcompany.com, and replies to common questions. To ensure timely attention to customer queries, IMC can pull back a message if it sits in an agent's message queue too long, and it lets you designate message priorities so important messages receive the fastest service.

When you're ready to take e-mail automation to the next level, check out Delano Technology's Delano e-Business Interaction Suite, a World Class product. Intended for sites that have complex automated messaging requirements, Delano's server lets you build an e-mail application into an e-commerce site using software components you select. The customized e-mail application you put together is triggered by specific customer actions and responds with a variety of actions, including parsing the message text, running an external program, saving the customer's data to a file or database, or sending an e-mail. The product's greatest strengths are its flexibility and the ease with which it integrates with e-mail, Web server, directory server and database systems.

Client maintenance

There's no way to avoid the drudgery of software inventory, license metering and software distribution, but using one of our four Blue Ribbon Award winners could make it easier and less time-consuming.

When we tested inventory and asset-management programs, Veritas Software's Veritas WinLAND emerged the leader. Equipped with a huge software database, WinLAND had no trouble identifying even obscure applications. It also provided plenty of hardware details. WinLAND's unbeatable selection of reports and options for exporting those reports kept the process running smoothly.

For license metering, we were most impressed with Sassafra Software's KeyServer, a sophisticated program in a small package. To help you stay legal, KeyServer tracks user applications, ensures that each copy

has a valid license and stops people from running inappropriate or unlicensed software. It's a breeze to install, and its light server requirements are a welcome bonus.

LANovation's PictureTaker Enterprise Edition emerged the best in our tests of four software distribution products. It delivers superior control over captured files and can work with existing network directory services. Any Windows 95 or 98 station can act as a console. You can install a program from a Web page.

For mobile users, it's a different story. Sterling Commerce's Connect:Manage specializes in software distribution and asset management for remote systems. Its strengths are support for browsers and proprietary clients, an intuitive channel architecture, and use of native NT groups for authentication.

Operating systems and more

In the spring, we pitted Microsoft's Windows NT Server 4.0 against Caldera Systems' OpenLinux 2.2, evaluating performance, manageability, connectivity, scalability and security. Microsoft

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came out on top, thanks to NT's strong user interface, sophisticated Web services and broad Intel-based hardware support.

But don't get too comfortable with NT 4.0 because when Windows 2000 and its brand new Active Directory arrive this winter, you may find yourself in need of an NT management suite to help migrate your existing domains. We tested three products that promise to purge existing NT 4.0 domains of expired and redundant user names and accounts, consolidate multiple NT 4.0 domains into one, and handle the Windows 2000 migration. For a clean migration with extensive undo options, our vote goes to Aelita Software Group's Aelita Enterprise Suite.

Another frequent cause of operating system headaches is the multitude of NT hot fixes and Service Packs. Keeping up with them can drive you nuts, or you can seek relief with Service Pack Manager from Gravity Storm Software. Service Pack Manager displays a current list of available Service Packs and associated hot fixes, and lets you select the ones you need, download them from Microsoft's Web site and distribute them across your network in just a few simple steps.

Access, access, access

Access to the network. Access to company resources and data files. Access to the Internet. Users want it all.

For providing dial-up access to the network, the product we liked best is Lucent's Max 6000 remote access concentrator. Top-rated throughput, a strong feature set and small form factor put the Max 6000 on top of six other competitors in our review.

Even after you've made it possible for remote employees to connect to the network, it's not always easy to keep them in the loop. FirstClass Intranet Server from MC2 Learning Systems (which acquired SoftArc in June) delivers a full range of collaboration features — including Internet e-mail, telnet access, discussion groups, real-time chat service and newsgroups — in an easy-to-manage package. FirstClass Intranet Server Gold was released last month.

When users need to share data files between Windows and Unix platforms, Network File System (NFS) is the typical solution. And Hummingbird Communications' NFS Maestro Gateway won a Blue Ribbon in our tests. It is well integrated with Network Integration Service, a distributed database that lists available resources within NFS, and it's the only product we tested that supports the WebNFS protocol for Web-based resource access and sharing.

IP address management keeps your local clients connected to the outside world. In our test of five DNS and Dynamic Host Configuration Protocol (DHCP) servers, we looked for products that work well together, translating domain names into IP addresses and assigning users temporary IP addresses as they log on to a network. Shadow IPserver from Network Telesystems worked best. We tested Version 3.023; Network Telesystems is completing work on Version 4.0, which will include additional policy management features, Lightweight Directory Access Protocol support and stronger security.

Sullivan, formerly Network World reviews editor, is now a freelance writer in Chicago.

"The optimist thinks this is the best of all possible worlds. The pessimist fears it is true."
Robert Oppenheimer

PRODUCT: WEBTREND LOG ANALYZER,
FOR WEB SITES

VENOOR: WEBTREND

WEB SITE: WWW.WEBTREND.COM/
PRODUCTS/LOG/OEFAULT.HTM

Reviewer's take: "WebTrends makes it easy for anyone with log file access to generate a report."
—Powell, PINT

PRODUCT: SERVICE PACK MANAGER,
FOR WINDOWS NT UPDATES

VENOOR: GRAVITY STORM SOFTWARE

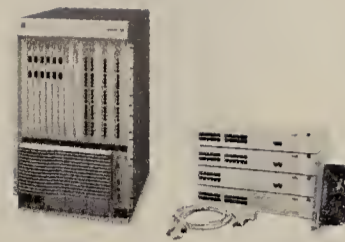
WEB SITE: HTTP://HOME.SAN.RR.COM/
GRAVITYSTORM/

Reviewer's take: "If you're tired of constantly hitting the Microsoft Web site for NT updates, and if the installation of the hot fixes on all of your machines has become a migraine inducing problem, we recommend getting a copy of Service Pack Manager 4.1. It's easy to install, a snap to use, and provides system administrators with welcome relief from the monotony of Service Pack and hot fix maintenance." — Currier, Duke University



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User favorites

A survey of *Network World* readers shows an affinity for IBM products and services. by Paul Desmond

When we set out to discover what network products and services you like best, we weren't necessarily expecting any big surprises. Perhaps that's why some of the results, notably your loyalty to IBM, shocked us. Big Blue products came out on top in four of the 10 product categories.

We examined the results by a few criteria. First is pure usage, meaning the percentage of respondents saying they use a product or products. Then we looked at the percentage of respondents who voted a product as best in its category. Here users could choose only one product. Finally, we examined each product's rating according to the Dominance Index, a statistical measure created by STAT Resources, a Chestnut Hill, Mass., research firm that conducted the survey for us.

The Dominance Index is intended to show the level of customer loyalty. For example, if 100 respondents say they use product X, it stands to reason that most of them will choose it as the best product in its category. If all 100 do indeed choose product X, Dominance equals the expected 1.0; it means preference for the product is right in line with usage level. If only 40 of the 100 choose product X, Dominance is 0.4 — that's not good; it means 60% of the product's user base likes another product better. And if more than 100 respondents say they like product X best, Dominance would be above 1.0, which is very good. Such an index means respondents who use more than one of a given type of product are voting for product X more often than is to be expected, or the product is attracting "Best" votes from outside its user base.

Spotlight on IBM

IBM begins its strong showing in the PC server category. While Compaq ProLiant came out ahead in terms of usage and the Best vote (barely), IBM Netfinity takes Dominance. Among the 128 respondents who voted for a Best server, Compaq's lead is a slim 2% over IBM, 35% to

33%, which is statistically insignificant. But IBM's 1.4 Dominance is significantly higher than Compaq's 1.1.

Compaq's loss is greater among larger users — more than 5,000 client machines — with a Dominance Index of 0.8 to IBM's 1.3. Hewlett-Packard and Dell lose out in Dominance, with overall indexes of 0.8 and 0.7, respectively — a statistically significant difference from Compaq and IBM.

Compaq does well in smaller shops, however. It ties with IBM for the top in Dominance at 1.4. HP is next at 0.9; Dell is at 0.5.

It's a similar story with Web servers. Among 150 respondents, Apache Group's Apache Server took the crown for most widely used server with 41%, compared to 34% for Microsoft Site Server 3.0 and 30% for IBM WebSphere Application Server 2.02, Enterprise Edition. IBM Lotus Domino Release 5 and Netscape Netra I 3.2.1 each had 23%.

But IBM's WebSphere beats Apache 32% to 27% among the 121 users who voted for one server as Best and blows it away in Dominance with a whopping 1.8 to Apache's 1.1. Netscape Netra I 3.2.1 was third in Best voting at 14% and in Dominance at a status quo 1.0.

Site Server and Domino R5 have problems, with Dominance indexes of 0.6 and 0.5, respectively. On the other hand, these versions are fairly new so it could be that users are still climbing the learning curve.

IBM likewise rocks the e-commerce platform category with an impressive 59% of respondents using its Net.Commerce3 product, more than twice as many as nearest competitor Microsoft, with 28% for Site Server Commerce Edition. Netscape's CommerceXpert Suite was third at 16%; no other contender garnered more than 6%.

We should note that only 69 of the nearly 200 respondents gave answers in this category, the second-lowest response rate in the survey next to virtual private network (VPN) gateways. That's a sign of an immature market.

IBM also cleans up in the Best scores, chosen by 64% as their favorite, better than three times Microsoft at 18%. IBM's Dominance is greater yet — a solid 1.3 to 0.8 for Microsoft and Netscape. IBM even further dominated the large-user category, with 73% of the usage, 80% of the Best votes and 1.4 Dominance, in contrast to 0.5 for Microsoft and 0.7 for Netscape.

THE PORTFOLIO

We selected 10 product categories especially important to enterprise networking. Here are the favorites of readers who responded to our 1999 Best Products survey.

PC server	Web server	E-commerce platform	Enterprise management system	Storage-area network
Compaq's ProLiant	IBM's WebSphere	IBM's Net.Commerce3	Tivoli's Global Enterprise Manager	IBM's Enterprise Storage Server
				

The enterprise management system category made for another interesting race, with HP OpenView taking top honors for usage, named by 50% of the 131 respondents, followed not so closely by Tivoli Global Enterprise Manager at 31%.

As for Best scores and Dominance, it's once again IBM on top, with its Tivoli product coming in with 46% of the 94 Best votes and a 1.6 Dominance Index.

Cabletron Spectrum was next in Dominance at 1.4, with 17% of the Best votes, while Computer Associates Unicenter mustered a 0.9 Dominance Index but only 4% of Best votes. HP was second in Best scoring with 21%, but poorest of the four in Dominance with only 0.8; that's not terrible on its own, but it is a 0.8 difference from top dog Tivoli.

Tivoli comes on top in Dominance among large and small organizations, but its rating among larger firms is perhaps most telling. HP and IBM Tivoli are in a virtual tie on usage at 47% and 46%, respectively, but Tivoli cleans up on Dominance with a 1.5 to HP's 0.7. Cabletron ran a close third at 1.4, and CA was far behind the leader at 0.6.

The final category in which IBM had a stellar showing was storage-area networks. IBM's Enterprise Storage Server garnered 51% of the usage vote to 20% for its closest competitor, Compaq's Enterprise Storage Array 12000 Fibre Channel. HP's SureStore E Disk Array XP 256 was third at 18%. Sun's StorEdge A7000 was fourth at 16%, while Data General and StorageTek products tied at 14%.

But IBM holds up in the Dominance Index with a top-notch 1.3, compared to 1.1 for Compaq, 0.9 for Sun, 0.8 for StorageTek and 0.6 for HP and Data General. Best scores are likewise in IBM's favor, as it gathered 51% of the 63 Best votes to 20% or less for all the other contenders.

Beyond IBM

The differential between Window NT's usage score and Best product statistics in the operating system category is probably the most dramatic single finding in our Best Products survey.

Of the 191 respondents for the operating system category, 80% say they use Windows NT Server 4.0, twice as many as second-place NetWare 5. IBM AIX 4.3 came in third at 33%, followed by Sunsoft Solaris 7 at 29% and HP-UX 11 at 17%. All others were used by less than 10% of respondents. But in terms of which operating systems respondents like best, it's NetWare, with 25% of the respondents choosing it. NT trailed slightly with a 23% Best vote; AIX followed with 17% and Solaris with 12%.

Looking at Dominance, Novell outscores NT by a statistically wider margin, 1.5 to 0.7. AIX was second in Dominance at 1.2 and Solaris third at 1.0.

As might be expected, Check Point Software stands high atop the firewall hill. Check Point's Firewall-1 garnered a usage score of 43% from the 113 respondents, more than double any other competitor; Axent's Raptor was second at 19%, Network Associates' Gauntlet Firewall got 16%, Secure Computing Sidewinder Security Server landed 12% and all others were less than 10%. Check Point soundly beat its competitors in terms of usage at small (39%) and large (49%) user levels.

Check Point's lead held up in the Best scoring (35%) and in its 1.0 Dominance, not quite as good as Axent's 1.2. Axent came in second in Best scoring at 20% of the 79 votes cast, followed by Network Associates at 10%; all the others were in single digits.

If these are the best products, which are the worst? Go to Network World Fusion to voice your opinion.

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Most of the Dominance Indexes in the firewall category are in the 0.9 to 1.2 range. That reflects the fact that most users employ only one vendor's firewall and vote for it as Best. Network Associates is the lone exception. With a Dominance Index of just 0.7, it may have to be concerned about customer loyalty.

For the most part, users are satisfied with their chosen vendors in the VPN gateway category. It's also a sign of a relatively immature technology, one in which users don't have a lot of experience with different products and thus can't draw comparisons among them. The respondent base is further evidence: Only 56 respondents cast a usage vote and only 44 of them voted for a Best product.

In the VPN case, it's a two-horse show. Intel's LanRover VPN Gateway comes out on top in usage at 38%, while Nortel Networks Contivity Extranet Switch is next at 30%. Nortel comes out on top in large enterprises in usage at 42% (vs. 29% for Intel), but Intel is big with smaller shops — 45% usage to Nortel's 19%. No other vendor garnered more than 5% total usage.

Best voting mapped fairly closely to usage, with 36% selecting Intel and 23% choosing Nortel. Likewise, both landed respectable Dominance Indexes with Intel at 1.1 and Nortel at 0.9.

AT&T (IBM) victory

From the findings in the Internet access category, it's easy to see why AT&T wanted to buy the IBM Global Network.

The former IBM network, now called the AT&T Global Network, came in first in usage with 32% of 147 respondents on the net. MCI WorldCom's UUNET came in second with 31%, Sprint third with 17% and AT&T IP Services fourth with 11%. No other carrier landed more than 10%, although 40% of respondents selected "Other," an indication of the vast number of players in this market. Lots of companies also use more than one Internet access provider, an average of nearly 1.5 per respondent.

It's the Best scores and Dominance that really make the former IBM network shine. The service came in first in terms of Best voting at 43% and had the highest Dominance Index, an outstanding 1.5. AT&T's own IP Services, on the other hand, scrounged only 2% of the 91 Best votes cast and had a rather poor Dominance Index of 0.5, meaning roughly half its users like another service better. UUNET finished second in Best voting at 24%, with a solid 1.2 Dominance, while Sprint managed 14% of Best votes and has a few disloyal users, as its 0.8 Dominance indicates.

In the final category, Layer 3 Gigabit Ethernet switches, it was Cisco's turn to shine, at least in terms of usage and Best voting. A full 70% of respondents said they use Cisco's Catalyst 5500, far outdistancing the Cabletron SmartSwitch Router 8600 and 3Com's CoreBuilder 9000, which came in at 19% and 18%, respectively. No other vendor got more than a 10% share.

Cisco likewise cleans up in the Best voting with 58% of the total to Cabletron's 21%. All other vendors were in single digits, meaning 3Com suffered a big loss in loyalty. That was also reflected in 3Com's Dominance Index of 0.6 overall and a worrisome 0.3 in large shops. Cabletron topped the Dominance chart with its 1.4, while Cisco turned in a respectable 1.1.

A former Network World editor, Desmond is vice president of King Content, an editorial services company in Southborough, Mass. He can be reached at paul_desmond@king-content.com.

"It's no use saying, 'We are doing our best.' You have got to succeed in doing what is necessary."

Winston Churchill

The Dominance Index is a statistical measure, developed by research firm STAT Resources, meant to show customer loyalty. See story for further explanation.

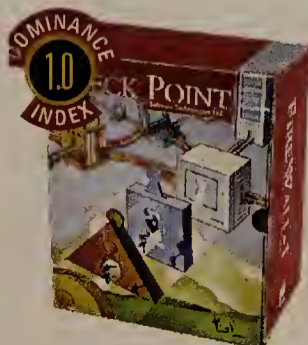
Operating system

Novell's NetWare



Firewall

Check Point Software's Firewall-1



VPN gateway

Intel's LanRover VPN Gateway



Internet Access

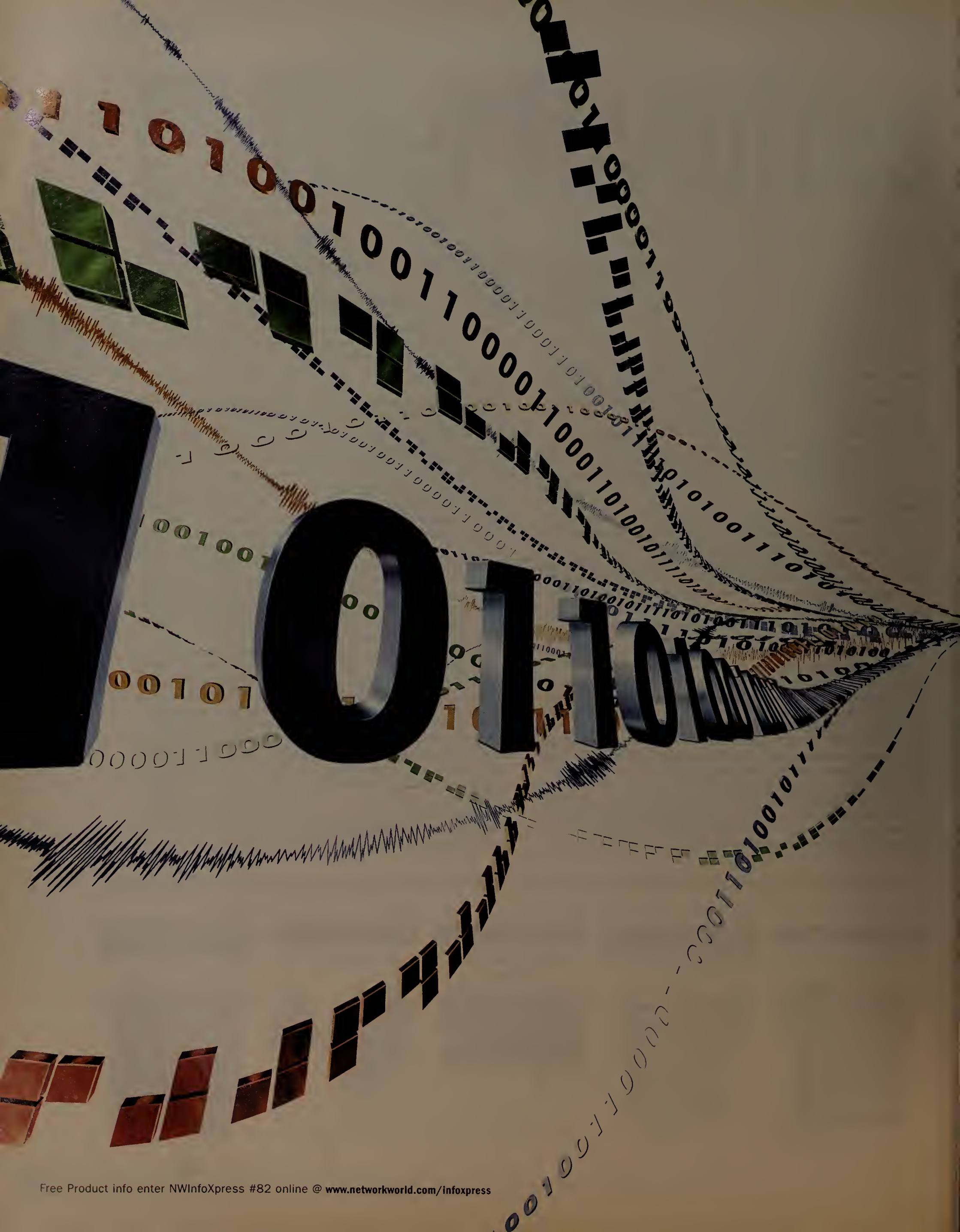
AT&T's Global Network

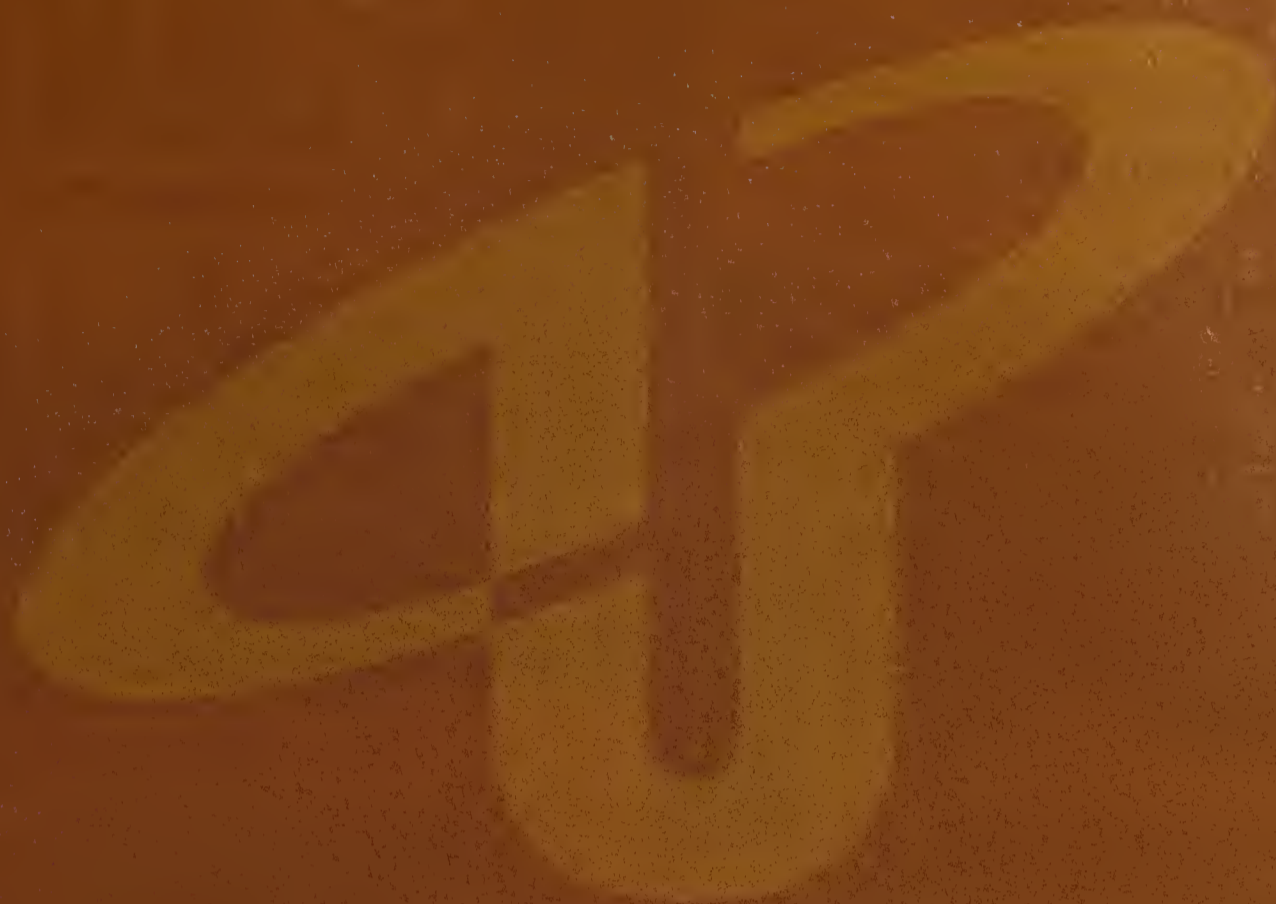


Layer 3 Gigabit Ethernet switches

Cisco's Catalyst 5500







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Business Week June 1999

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Wares extraordinaire

Network World columnists give us the scoop on category-breaking products and technologies.

The cynical among us might say network products are a dime a dozen. And to some extent, they wouldn't be wrong. A whole lot of products do little more than the next. Finding a product or technology that has the potential to change the networked world — or at least a little corner of it — is rare indeed. But nine *Network World* columnists have done just that. Here, in their estimates, are true category-breakers.



OUT ON THE 'NET QUICK LOOK

Dwight Gibbs "Foo' Bar"

The Call ★ Akamai Technologies' FreeFlow Internet content delivery service

Vendor: Akamai Technologies; www.akamai.com.

Pricing: Usage charges are priced according to megabits per second of content served. Customers commit to a minimum usage level and may "burst" above this commitment. For example, a committed information rate of 1M to 20M bit/sec costs \$1,995 per megabit/second.

Market status: Commercially available since April 1999.

A category-breaking service? That would have to be Akamai Technologies' FreeFlow Internet content delivery service.

FreeFlow analyzes Internet congestion and intelligently adjusts Domain Name System almost constantly so it can quickly and reliably deliver content. The data analysis involves some heavy algorithmic lifting that "is beyond all but a handful of the world's foremost scientists and mathematicians," says Gartner Group. In addition, Akamai has more than 900 servers in more than 25 networks. This architecture makes FreeFlow outrageously robust and scalable.

What's so special about FreeFlow? All it does is provide caching, right? Wrong. What's special is coverage, performance, control and information.

With FreeFlow, you don't have to be concerned about which ISPs use caching. All customers benefit from FreeFlow, and the performance gains are phenomenal. During the week of Sept. 5, for example,

FreeFlow served www.fool.com's content more than five times faster than our Web servers (as measured by Keynote).

With FreeFlow, I can control what content is and isn't cached. I don't have to worry about which ISPs are honoring my time-to-live specifications. I also can get a better handle on what content is being served, when it is being served and to whom.

Sounds good in theory, but how about in practice? The Motley Fool has been using FreeFlow since May, and it rocks. I see three main benefits:

- Better customer experience. The Fool site feels faster because the graphics (about 80% of the bits making up a Web page) are delivered by servers close to our customers over the fastest available routes. Customers e-mail us saying our content feels faster, and our Web site analysis tools show improved performance.

- Decreased hardware requirements. Each time a customer requests a Web page, a Web server must serve, on average, one HTML file and nine or so graphics. By using FreeFlow, I've off-loaded about 90% of my Web serving because my Web servers only have to offer up the HTML. Last month, FreeFlow served up more than 260 million hits for www.fool.com. This means I do not have to increase my server power nearly as quickly as I might otherwise.

- Decreased bandwidth requirements. Remember the 260 million hits my servers didn't have to serve last month? I didn't have to ship them out of my site, either, which means a lower load on my servers, switches, load balancers and routers. By how much? Let's assume each graphic file is 5K bytes. Do the math — that's a lot of bandwidth.



IN THE SECURITY REALM QUICK LOOK

Winn Schwartau "On Security"

The Call ★ Tecsec's Constructive Key Management cryptographic software

Vendor: Tecsec; www.tecsec.com.

Pricing: \$129, with volume pricing available.

Market status: CKM Version 4.7 currently shipping.

I have always found secrecy, privacy and encryption intriguing. In 15 years, though, I have only encountered a couple of companies with products that I felt were

"on the mark" function-wise. One of those companies is Tecsec, with its Constructive Key Management (CKM) cryptographic software.

One of the biggest complaints I hear about public-key infrastructure (PKI) products is the requisite infrastructure investment. CKM avoids that conundrum because it provides a truly distributed key management system that works with any existing network topology.

CKM manages the flow of and access to information at the basic object level. It controls who has access to whom and to what, where and when, across the network. Access controls also can be provided to databases, documents, photographs, Web pages or any other object that can be digitally represented or named.

CKM makes role-based access attributes inherent to each object. The attributes reflect access policies mandated by system administrators. So when laying out an enterprisewide system, attributes such as city, country, department, job title, clearance, hair color or sex, for example, are chosen to establish permission rights. Users carry identification on a floppy disk, smart card or other memory device that contains their attributes. When the "object" and user attributes match, the user has access to the object. What could be simpler?

The access to objects is determined cryptographically without access to data contents. This lets sensitive objects be routed around the network and other control devices without additional management. Thus, a document could be sent to the entire company or posted on an extranet site and only be intended for "single, blond-haired, dark-eyed, deeply tanned men who are six feet tall, weigh no more than 180 pounds and have an IQ of 130 or higher." The encrypted message would be out there for anyone to sniff or download, but only people with the corresponding credentials would be able to open it.

A CKM-protected enterprise does not have to be rearchitected. It sits on existing topologies without modification, thus providing a manageable, secure environment so customers can use the most efficient methods of communications available to them.

It's worth your time to go to www.tecsec.com and download the free demo for a hands-on experience.

ON THE CARRIER BACKBONE QUICK LOOK

Frank Dzubeck "Industry Commentary"

The Call Sycamore Networks' SN 8000 Intelligent Optical Transport Node

Vendor: Sycamore Networks;
www.sycamorenet.com.

Pricing: \$20,000 for base unit; \$48,000 to \$75,000 for line cards.

Market status: Commercially available.

Analysts, including myself, constantly assert that enterprise users need more bandwidth and that the lack of inexpensive broadband network access is the major impediment to the growth of the electronic commerce and e-business marketplaces. Unfortunately, some of us forget that if wishful thinking is transformed into reality, that stone wall will shift onto metropolitan, regional and long-haul transport networks.

According to my estimates, if every American were connected to the public network using a 56K bit/sec modem today, we'd need 15 terabits per second of network capacity. And if every American were "always on" using 1.5M bit/sec access, 409 terabit/sec of network capacity would be required. Add broadband business access (10M bit/sec per average business location) and you reach a staggering demand requirement for 25 petabits per second of network capacity.

In the New World of e-commerce and e-business, these projections make sense. For 1999, I project that network e-activity will produce about \$170 billion worth of electronic transactions; this figure will rise to \$2.5 trillion by 2004. Today in the U.S., we've got about 15 petabit/sec to 20 petabit/sec of raw (one wavelength per installed fiber-optic strand) capacity. However, not all that fiber is lit and distributed to the right locations for low-cost use by service providers and their customers.

Start-up Sycamore Networks is the leading creator of products that make intelligent optical networking happen economically. In its short lifetime, Sycamore has brought to market the first applicable optical product — the SN 8000 Intelligent Optical Transport Node — for metropolitan and regional access, as well as long-haul backbone transport.

The SN 8000, the most "wave shattering" of Sycamore's optical products, uses dense wave division multiplexing (DWDM) and supports up to 120 wavelengths with any combination of OC-3, OC-12 and OC-48 services. Using innovative technology, it extends transmission distance to 1,600 kilometers without electrical regeneration.

What's more, the SN 8000 is the first optical product to use a plug-and-play design. Sycamore's high-density OC-3 and OC-12 service modules will let as many as 16 OC-3 or four OC-12 services share a single wavelength. For the first time, a DWDM product with integrated modules will eliminate the need for electro-optical network equipment — SONET/SDH add/drop multiplexers and cross-connects.

The only way to ensure a constant rate of e-economic growth and keep up with consumer and business demand is for service providers to build next-generation networks using intelligent optical wavelength technology. Two carriers, Millennium Optical Networks and Williams Network, already have chosen to do so using the SN 8000.

"Riding the wave" into the next century with Sycamore is a win-win proposition for service providers and their corporate customers. The SN 8000 equates to ease of use, less space and power consumption, a dramatic increase in bandwidth distribution capability at drastically lower costs, and increased equipment reliability and service availability.

ON PUBLIC AND PRIVATE NETWORKS QUICK LOOK

Daniel Briere and Christine Heckart
"WAN Monitor"

The Call Visual Networks' Visual UpTime WAN management software

Vendor: Visual Networks (recently merged with Inverse Network Technology).
www.visualnetworks.com

Pricing: \$1,195 for 56K bit/sec Analysis Service Element (ASE); \$3,995 for T-1 ASE; \$19,995 for DS-3 ATM ASE; and \$11,995 for Tier 0 Performance Archive Manager.

Market status: Commercially available.

Visual Networks' Visual UpTime WAN management software has changed the service provider model for deploying and managing data services. It has become the default standard for network performance monitoring and service-level agreement (SLA) measurement. Carriers such as AT&T, Bell Atlantic, MCI WorldCom and Sprint package the software as a standard or optional component of frame relay and ATM services or embed it in their network infrastructures.

With Visual UpTime, service providers can share detailed and more granular views of network performance in real time with customers. The software provides reports on a variety of network elements, such as ports and permanent virtual circuits on a frame relay network and the network components that generate the most errors.

Service providers encourage users to select managed service options using Visual UpTime because it lets them better manage the service. In the U.S., we see few examples of this type of advocacy for premises equipment. The ubiquitous packaging and support of Cisco's routing products with carrier services would be another example.

Many corporations use Visual UpTime to monitor network performance and hold service providers to SLA terms. Delta Airlines, Federal Express and Marriott have chosen the tool.

Visual UpTime's benefits include greater network reliability and availability through the use of real-time performance metrics and historical reporting. Ultimately, that translates into lower network operation cost and maintenance because diagnosis and trouble isolation can occur more quickly and accurately.

Continued on page 90

"The best minds are not in government. If any were, business would steal them away."
Ronald Reagan

BUILD A GREAT SITE AND THEY WILL COME.

MAKE THEM WAIT EIGHT SECONDS AND THEY WILL LEAVE.



Studies show that if Web users have to wait longer than 8 seconds for pages to download, chances are they're history. Conventional technology has focused on rocketing packets from A to B. But because Web traffic is unpredictable, event-driven, and conversational, managing it requires intelligence, as well as speed.



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bringing an end to "Server Not Found." But we don't stop there, because only ArrowPoint also optimizes content delivery – 90% of today's Web traffic – using the best server located anywhere in your distributed network.

ArrowPoint Web switches eliminate aggravating waits and help your site keep its cool, even with flash crowds. They create sticky connections so shopping carts don't suddenly vanish. And they deliver big content flows – like streaming media – fast.

ArrowPoint, the Web switching pioneer, is already on the job providing intelligence and performance with content smart Web services for some of the world's leading Web hosting, broadband and e-commerce companies. Check out our Web site to see what we can do for you.



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Continued from page 88

We chose Visual UpTime as our category-breaker because it's an existing product that already has made a substantial and measurable impact (not just the promise of one). In addition, Visual UpTime has a direct (not just indirect) benefit to IT managers.

IN THE DIRECTORY DOMAIN QUICK LOOK

James Kobiellus "Above the Cloud"

The Call Novell's DirXML metadirectory software

Vendor: Novell; www.novell.com.

Pricing: Not available.

Market status: Due for beta testing this quarter.

With its July 1999 announcement of this forthcoming metadirectory product, Novell became the first directory software vendor to position XML as its core format for directory schema publishing, data interchange and query. DirXML will use XML to integrate schemas and data from external sources into logically integrated views under Novell Directory Services (NDS) Version 8.

What will set DirXML apart from other metadirectory tools is its ability to use XML-based metadata to manage a growing range of applications, services, data types and other resources. Directories are increasingly expanding beyond their traditional role of managing account and resource information for e-mail and network operating system (NOS) environments. You would be hard-pressed these days to find a platform vendor — or industry alliance — that is not mapping various system interfaces and interchange formats to XML. Similarly, vendors are increasingly using XML as a standard metadata format for describing all intranet/extranet services and resources.

All this XML-based application metadata will eventually find its way into general-purpose enterprise directories. With DirXML, Novell will position XML as the common language that NDS 8 and applications use to speak to each other. Eventually, as directory vendors rearchitect their products around the XML-based Directory Services Markup Language (DSML), still under development by a multivendor working group, XML will become the standard by which all directory services expose their structures and content to each other and to applications.

The DirXML announcement provides a glimpse into how XML will be integrated into metadirectory and general-purpose directory environments by the industry at large. The devil's in the plumbing, and DirXML will ship with a developers kit for creating stylesheets and connectors for translating directory information into common XML schemas. Developers will be able to create an Extensible Stylesheet Language Transformation stylesheet for each NDS 8-enabled application. The stylesheet will reside under NDS 8 and define the mapping of events, data and schemas between the application and the directory into DSML-compliant schemas.

In addition, NDS 8 directory administrators will be able to use DirXML to map DSML schemas and data into Lightweight Directory Access Protocol Version 3, LDAP Directory Interchange Format and various application-specific formats to enable interoperability with legacy, non-XML-enabled applications.

DirXML will initially ship with connectors to other vendor's directory products, but these may become less important down the road as other vendors implement DSML as a native import, export and storage format.

However, Novell and other vendors will have to continue converting legacy directory data formats into XML for the next one to two years, until the eventual DSML standard becomes widespread and XML-to-XML interchange becomes routine.

As enterprises rely more on directories to manage networked applications, they will need access to the XML metadata that increasingly describes networked resources. Novell's DirXML — which we should not expect in shipping form for at least six to nine months — will be the forerunner of the XML-aware directory architecture of the 21st century.

ON THE APPLICATIONS FRONT QUICK LOOK

Dave Kearns "Wired Windows"

The Call Business Layers' eProvision Employees

Vendor: Business Layers; www.businesslayers.com.

Pricing: \$30,000, plus \$30 per provisioning profile.

Market status: Expected to ship in the first quarter 2000.

Business Layers' eProvision Employees not only sets a standard, it creates a whole new category of application — "eprovisionware."

But what is eprovisionware? Typically, the successful integration of new employees requires the completion of a wide variety of provisioning activities: equipment procurement, password allocation, security clearances, application setup, Internet access and much more. Traditionally, this is handled — or, more often, mishandled — by interminable memos, phone calls and ad hoc meetings in the hallway. Too often, a new employee shows up on the first day of work and is less than productive because of missing components in the provisioning activities. Eprovisionware automates most of these tasks.

EProvision Employees ties together an enterprise's directories, databases and "people-centric" applications, such as help desk, human resources, enterprise resource planning systems, network management systems and electronic software distribution systems, through a browser-based application centered on forms and forms processing. The forms are then tied directly to the directory service, the databases and the applications using standard interfaces (such as LDAP and XML) or through direct hooks to APIs. The software is modular, letting the enterprise centralize some parts of the provisioning process while decentralizing those that work best when distributed.

While eProvision Employee automates much of the provisioning process, enterprise network managers will still need to do a lot by hand (such as physically installing the hardware). Fortunately, the package comes with a built-in reporting tool that can be used to ensure that manual processes are being completed as needed. Business Layers' software doesn't stop being useful once the new employee starts, either. It's an ideal tool to handle individual or departmental moves quickly and efficiently.

And when the day comes that an employee leaves, eProvision Employee can be used to remove or disable accounts, find the keys, cell phones, laptops or other business accessories the employee has been using.

This package isn't cheap: at \$30,000 plus \$30 per provisioning profile, cost can add up quickly. But in today's fast-paced business world, with companies quickly merging and as quickly spinning off new divisions, subsidiaries and joint ventures, provisioning employees can cost in the millions of dollars each year. By automating much of this process, eProvision Employee can shave a huge percentage of that cost while at the same time getting the provisioning done more quickly and accurately. B.

"It's a funny thing about life; if you refuse to accept anything but the best, you very often get it."

W. Somerset Maugham

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On the carrier backbone: Scott Bradner, "Net Insider" columnist, gives his take on Chromatis Networks' Selective WDM technology.



FURNALDGRAY

In the directory domain: Mark Gibbs, "Backspin" and "Gearhead" columnist, tells us why he considers Microsoft's Active Directory a potential market breaker.



PAUL K. NIELSEN

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Attracting the best talent

Creativity is key when it comes to luring potential IT employees. by Beth Schultz

One of your network administrators has just given notice that he's leaving to pursue other interests. You wish him a fond farewell, then get down to business — you need to find a replacement, and pronto.

You dig out a recruitment ad you drafted three years ago, brush it up, then rush it off to your human resources department. You're feeling great: It's not even noon, and you've already made considerable headway toward finding a great new someone to watch over your gigabit backbone.

Nice try. If your idea of effective recruiting rests on an ad in the Sunday help wanted section, you're sorely out of touch with today's best hiring practices. Once a bastion of employers and job seekers, newspaper ads today serve next to no purpose for smart companies looking for IT talent.

"The only people reading newspaper ads are those who are job hunting, but most people make job changes when they back into an opportunity. A recruiter calls, or a friend or a vendor," says Jane Snipes, project manager at Management Recruiters in Kannapolis, N.C.

If you still haven't developed more with-it methods for recruiting, be warned: Your competition for IT talent has. Sunday recruitment advertising is down 20% from 1998, says Duke Getzinger, president of Interaction, Inc., an interactive ad agency that focuses on recruitment. Much of the decline can be attributed to high-tech companies rethinking how to get access to potential employees, he adds.

Brooktrout Technology, a small network equipment vendor and Interaction client, is one company willing to venture into unusual waters to find new employees. In fact, the company hasn't posted a job ad in the main local paper in about two years. As Brooktrout's HR Director Jamie Basler says: "We want to attract computer-literate people, and that takes a different approach."

Basler, like counterparts at an increasing number of technology companies, favors the Web as a recruiting tool. Last year, more than 80% of the 10,000 résumés Brooktrout received came from the Web. It hired 75 of those people. "We obviously have to do a lot of sifting, sorting and

screening, but we've found posting and sourcing résumés on the Web to be highly effective," Basler says.

But even posting and sourcing résumés on the Web is becoming blasé. So what did Basler do this fall to find the Unix administrator and help desk technician needed to round out Brooktrout's IS department?

For starters, Basler coupled an age-old incentive — cash — with a New Age employment forum — the Web. Her goal was to extend the company's employee referral program to outsiders via a Web site.

As of late September, anyone who has a Web browser can hit www.brooktroutcash.com, read about open positions at Brooktrout and refer someone. If the nominee gets hired, the person who submitted the



"The *best* and most beautiful things in the world cannot be seen or even touched — they must be felt with the heart."
Helen Keller

name pockets \$1,000.

Likewise, successful internal referrals will net an employee \$3,000. Basler has even reprogrammed the company coffee machine so its electronic greeting reminds employees of the referral program.

Brooktrout IS Director Chris Ledoux

especially likes the idea of BrooktroutCash.com and the internal referral program. "It's how we've gotten great people from all around [Boston's] Route 128 high-tech area."

Of course, it's not likely that many people will just happen upon BrooktroutCash.com in a routine Web

stroll. So Basler has to promote the site. For that, she envisioned the company's name on the big screen. Customers seeing movies at one of five theatres near Brooktrout headquarters in Needham, Mass., or one near the company's Los Gatos, Calif., office will see a preshow ad promoting the BrooktroutCash.com

site. "These are captive audiences of local people — why not?" Basler says.

The same could be said of commuters driving down Route 128. That's why Basler plans on draping headquarters with a banner advertising the company's hiring needs in general or BrooktroutCash.com in particular. The building is visible from that hallowed highway, and Basler already has found banner advertising effective in drawing IT people to open houses she's held to find new hires.

Silicon Valley companies have found building banners and billboards effective at getting the word out on hiring, as well. On-Link Technologies, an electronic commerce start-up, even sent an airplane circling over the heads of commuters in the San Francisco Bay Area one morning last month. Its target: employees at Intel, Oracle, Siebel Systems and Sun who might be impressed enough to pursue jobs with the company.



Chris Ledoux (r), IS director at Brooktrout, is a happy guy thanks to the creative recruiting efforts of HR Director Jamie Basler.

Finding the best job candidates is all about motivating people and driving their curiosity, Interaction's Getzinger says. He cites as an example a recruitment campaign he orchestrated for Motorola, which was seeking embedded systems engineers.

Interaction secured the registered attendee list for an embedded systems engineer conference and sent 1,300 people from that list a transparent plastic card with the simple message: "www.forewarned.com. Go ahead, tempt fate." The card piqued the curiosity of 1,100 recipients.

Once each of these people went to the Web site, they discovered that Motorola had job openings. "We provided a comfortable environment where they could provide information to Motorola without their employer knowing," Getzinger says.

Hiring managers within corporate IT (or their partners in HR) have to use the same sort of resourcefulness in trying to find new employees.

"You've got to apply reverse engineering. You have to base your search on the habits of the people you want

Continued on page 96

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Continued from page 94

to hire," Getzinger says.

If you're looking to hire a WAN technologist, for example, then the best place to start is with other people in the network department. Ask those folks what newsgroups they participate in,

what publications and newsletter they read, what Web sites they visit, what associations they belong to, and what trade shows and conferences they attend. Heck, even ask them to save all their junk mail. Then get the mailing lists, contact the Webmasters, hunt down membership information or

attendee lists, and think of some innovative way of capturing the attention of all the other people on those lists, he says.

Maybe one of your network staff participates in a local user or standards-setting group. Open your doors for the group's next meeting, give everybody some pizza and something to drink, and

leave them with literature on your IT department and what jobs are available, Getzinger suggests.

Maybe your staff members download source code from a favorite site. Sponsor that site, but don't stop there. If you really want to capture the attention of potential job candidates, see if you can get your recruitment ad placed in the window that appears while that source code downloads.

While recruiting college students, one Interaction client asked for a family history. It discovered that 63% of the students were pursuing engineering degrees because a parent had one. Now that's an interesting statistic that the best hiring managers would run wild with, Getzinger says. "Use the student as a liaison to the professional. Offer an incentive: 'If we hire your mom or dad, we'll pay for your books for a year.'"

Inacom, a large technology outsourcing firm, wanted potential job candidates to have fun at its Web site while it gathered knowledge about them. So it morphed plans for an Internet-based technology assessment tool into development of a multimedia game that quizzes participants on a variety of LAN and WAN topics. Top scorers are eligible for a quarterly \$1,500 same-as-cash



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drawing. They also become the target of one-on-one marketing: "We capture people's names, mailing addresses and e-mail so we can recruit them," says Eva Fujan, vice president of technical recruiting at the Omaha, Neb., firm.

Inacom passes out "tickets" for game play to potential job candidates at career fairs, college recruitment sessions and trade shows. Fujan estimates that an average of 2,000 people play the game monthly and that Inacom has hired between 200 and 300 of them (out of a total of 2,000 to 3,000 employees yearly).

She considers the game a big success and intends on expanding it to drive even more people to the site. After all, even if those people play the game but don't apply for a position, they'll be giving Inacom their contact info — and that's a huge advantage for anyone in hiring mode.

As Shaun Kelly, vice president of IT recruiting firm EDP Staffing Services in Newington, Conn., and author of Network World Fusion's Career Doctor column, points out: One of the best things to remember when you're looking for job candidates is that they're not looking for you. B.

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HONORING EXCELLENCE



Each year, *Network World* honors user organizations that best demonstrate innovative or effective use of network technology to achieve business objectives. We continue the tradition here, showcasing the winner and two runners-up in our 1999 User Excellence Award competition.

This year's winner, Olsten Staffing Services, is a world leader in staffing services and a major division of the \$4.6

billion Olsten Corp. In order to better serve its hundreds of thousands of full-time employees and temporary workers, Olsten overhauled its campus and wide-area networks, as well as the applications running on them. The three-year project saw the ouster of an AS/400-based multidrop, dial-in environment and the arrival of Unix servers, frame relay and ATM, as well as business-critical enterprise resource planning applications. The company's unwavering dedication to meeting business objectives secured its win (see story, this page).

The first runner-up, Western Heights School District, educates students from kindergarten through high school in Oklahoma City, and it teaches us that convergence can work — today. It has spent the past five years building a converged voice-and-data network in order to enable better teaching methods. The district can now support video and distance learning on the same fiber with which it accesses the Internet, e-mail services, makes phone calls and runs data applications. For its innovation in education and commitment to convergence, it gets a gold star (see story, page 103).

The second runner-up, Trottnier-McJunkin, shows U.S.-Mexican relations at their best. The company is a 50-50 joint venture between McJunkin, a U.S. distributor of industrial products, and Casa Trottnier, a similar Mexican firm. To smooth business operations, Trottnier-McJunkin integrated international voice and fax traffic onto a cross-border frame relay network. It earns kudos for accomplishing its data connectivity goals while reducing international telephony bills and the overall cost of existing leased-line networks (see story, page 109).

Top-notch net

Temporary employment giant Olsten Staffing Service soars to new heights in customer service thanks to major infrastructure and application projects. by Paul Desmond

One Thursday this summer, an Olsten Staffing Services office in Grand Haven, Mich., got a call from a large customer that needed 28 workers on the job beginning that Sunday night, the Fourth of July. Oh, and it needed them for the graveyard shift.

Enlisting that many people to start working late at night at the tail end of a long holiday weekend is a tall order even for Olsten, which is in the business of finding temporary help. But the Grand Haven office got a little help of its own, says Barbara Dillon, vice president for Olsten Staffing's Central division.

Using a new order distribution application, the folks in the Grand Haven office zapped the request to peers in nearby Grand Rapids and Holland. With the application, each office could check its database of available assignment employees with the click of a button, Dillon says.

Net result: The customer, an office furniture manufacturer, had the 28 workers (plus some) it needed on Sunday night.

The system was three years in the making, the result of an overhaul of the company's campus and wide-area networks as well as the applications they support. Gone is a hodgepodge of multidrop and dial-up lines, replaced by a frame relay WAN feeding ATM DS-3 access links. Gone, too, are a slew of AS/400s, replaced largely by Unix servers in a central data center running Oracle and PeopleSoft enterprise resource planning (ERP) applications.

The new, centralized database and accompanying applications give Olsten branches the ability to share data like never before, creating opportunities for them to help one another quickly find the best-qualified temporary employees. Billing and reporting systems have likewise been streamlined, allowing Olsten to meet the demand for custom invoices and reports. And this is all riding on a network infrastructure that puts a premium on redundancy.

What really earned Olsten the 1999 Network World User Excellence Award, however, was its unwavering dedication to meeting business objectives. The project involves plenty of leading-edge technology, but none of it is mere technology for technology's sake. James Harding, Olsten Corp.'s chief information officer, says of the project: "It was a business imperative if we were to continue to operate and grow substantially."

In the beginning

To fully appreciate the scope of the project, known as Project Reach, you have to go back to 1996 and understand the dilemma Olsten faced. At that time, Olsten Staffing was a \$2 billion company, having grown dramatically from revenue of less than \$100 million in 1980. It was clearly outgrowing its IS infrastructure, some of which Harding says dated to 1969.

Olsten Staffing in 1996 was largely a paper-driven company, says Linda Guillerault, an assistant vice president who was one of six field personnel chosen to co-lead a Project Reach technical team that would help ensure that the project met business requirements. Job applicants filled out paper applications, which were filed with additional documentation, such as test scores and interview notes detailing special skills. When a customer called looking to get a position filled, an Olsten staffer would pour through all the paper files looking for a good fit.

This paper-intensive, manual process made it difficult for one field office to help nearby branches fill positions. Olsten has some 625 field offices, many of which are located near each other, as in Michigan. But searching for candidates from another office meant phone calls, faxing back and forth, and culling through lots of paper files. Given all that, Dillon says it's unlikely that the furniture manufacturer would've been fully staffed on July 4 without the new order distribution system. The localization of client data made it especially difficult to service large corporate accounts properly. A big client, such as Chase Manhattan, would in

CLAY PATRICK MCBRIDE

work overhaul



Bringing Olsten to new heights: John Loria, director of enterprise networking; Darin Prill, assistant vice president of technology; James Harding, CIO.

effect have separate accounts with different field offices. Sending a single bill to such a client was therefore difficult, if not impossible, as was generating reports for customers detailing how many employees they used, for what positions and so forth. "Reporting was done area by area, region by region, in small Microsoft Access databases. It was difficult and time-consuming," Guillerault says.

Intracompany communication likewise left much to be desired. The main form of communication from headquarters to the field offices was a mail packet sent twice weekly. Now, it's e-mail and an intranet.

The fix

Olsten Staffing had two main goals for Project Reach: help deliver assignment employees and provide information to customers. The information includes performance data on how well positions are being filled, how much the customer is spending, and so on.

"Management of data was a major IT imperative," Harding says. "Unless we could centralize it, we couldn't manage it."

Centralizing the data, in turn, dictated a reliable, high-performance WAN as well as a high-speed headquarters net that could support a few key applications. It also meant ditching virtually every bit of infrastructure already in place. In short, it was the kind of project about which IS pros dream. "You get the opportunity maybe once in your career to start something like this and finish it," says Darin Prill, assistant vice president of technology for Olsten.

IS also had an ulterior motive.

"In the process, we got Y2K-compliant. There was no remediation. We just threw the old stuff out," Harding says.

Olsten early on decided what applications it needed to support, opting for Oracle Financials and a PpeopleSoft payroll system. It also decided on continued use of Precise, a custom front-end system that facilitated data collection in field offices. But enhancements were needed so that Precise could feed data to the new back-end applications.

Next, Prill and his team met with 3Com and AT&T to map the network design. Olsten decided to go with 3Com for two reasons, one being that it had low-end 3Com gear installed in its field offices and wanted to stay with a single vendor, says John Loria, director of enterprise networking.

Similarly, Olsten already had a contract with AT&T and was able to renegotiate it to address the new requirements.

For the wide-area, Olsten opted for a frame relay network configured in a hub-and-spoke design, with 56K bit/sec ports and 32K bit/sec committed information rate (CIR) to most field offices. Now, nearly two years after it was installed, most of those connections are being upgraded to 256K bit/sec ports with 128K bit/sec CIR, a testament to the configuration flexibility inherent in frame relay, Loria says. A few larger facilities have multiple T-1 links back to the data center, which is located at the company's headquarters in Melville, N.Y.

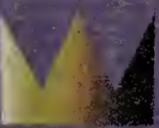
Olsten uses AT&T's frame relay-to-ATM interworking service to merge all the frame relay traffic onto a single DS-3 ATM connection to the data center. The DS-3 connects to AT&T's Accu-Ring service, which uses self-healing fiber rings to provide a high level of redundancy in the local loop. A second DS-3, also from AT&T but delivered over a different physical path, serves as a backup, so there is no single point of failure into the AT&T network.

The ATM link terminates on a 3Com PathBuilder S-600 WAN Access Switch at headquarters. But the company had to jump through a bit of a configuration hoop to pull it off because the S-600 can't connect via ATM to the four 3Com CoreBuilder 7000 switches that form the backbone of the campus ATM LAN. Instead, the S-600 translates data back to frame relay format and connects each permanent virtual circuit to one of three 3Com NetBuilder II routers. The routers, in turn, convert the data back to ATM and ship it to the CoreBuilder 7000s.

"We started this when ATM wasn't mature enough to do what we needed. We had to cobble something together," Prill says.

Redundancy is key in the headquarters LAN. There is a backup NetBuilder II router outfitted with three configuration images, one for each of the primary routers. It can be brought online with the swap of a cable should any of the primaries fail.

The CoreBuilder 7000 switches connect to each other in a mesh configuration. Redundant 100M bit/sec connections link the 7000s to 11 3Com SuperStack II Switch 1000 switches, which connect to one of 65 SuperStack II Hub 40s via switched 10M bit/sec links, or to one of five Superstack II Hub 100s via switched 100M bit/sec connections. Users get 10/100 network cards.

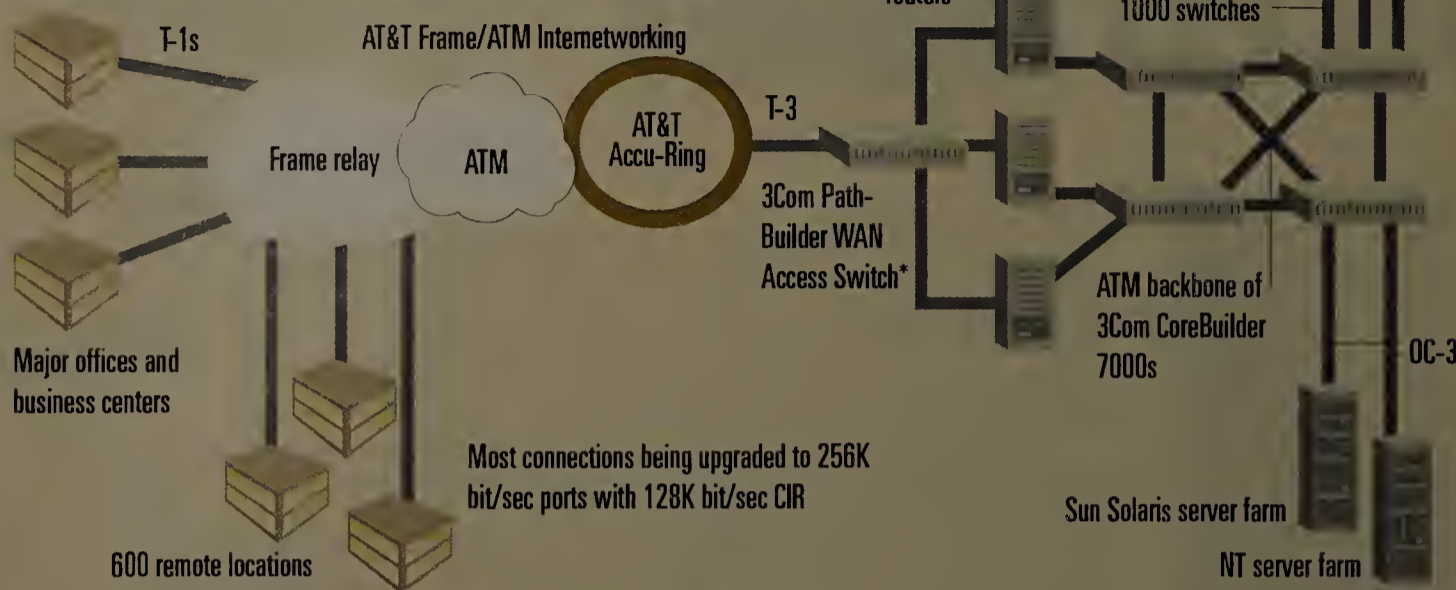


"The best leader is the one who has sense enough to pick good men to do what he wants done and the self-restraint to keep from meddling with them while they do it."

Theodore Roosevelt

OLSTEN'S NETWORK REACH

Remote offices have no trouble connecting to data center applications thanks to Olsten's new network infrastructure.



* The WAN access switch translates ATM data to frame relay and connects to routers. The routers, in turn, convert the data back to ATM.

This infrastructure supports 14 Sun Solaris servers, about 75 Windows NT servers and 550 end-user machines. The Sun servers and about half of the NT servers connect directly to the CoreBuilder 7000 switches at OC-3 speed. The remaining NT servers link to the 7000s via switched 10M or 100M bit/sec links.

The bulk of Olsten's Precise applications run on a single, 12-processor Sun Enterprise 6000 server, as do the Oracle Financials applications and the PeopleSoft payroll application. Each of these core applications also has an identically configured standby Sun machine in an active/passive cluster. "We've got half-million dollar machines that are only there in case another half-million dollar machine goes down. This redundancy is necessary because of the mission criticality of the three applications," Prill says.

The remaining Sun servers support functions including Oracle databases, Hewlett-Packard's OpenView management system, the intranet, help desk, backup servers and application development. The NT servers support applications including Microsoft Exchange e-mail, a printing operation that handles 75,000 paychecks per week, Microsoft's Systems Management Server management application, file and print, and network authentication.

The Precise front-end used by field offices is key to keeping the amount of data flowing over wide-area links to a minimum, Prill says. Precise collects only the exact data each application needs, such as the bare minimum it takes to produce a paycheck. That data is then fed into the appropriate ERP system using APIs Olsten built.

The results

Olsten won't say how much it spent on the project, but if you look at a few of the costs, you'll get an idea. 3Com estimates Olsten paid \$3.5 million for its equipment. Prill thinks that's low and notes that Olsten also pays 3Com \$500,000 per year for support. The company also has at least eight Sun servers worth \$500,000 each. Recurring frame relay charges to 625 branches? That adds up quickly. "The infrastructure cost was in the multimillion dollar range," Prill says.

Given that Olsten completed Project Reach in May for the U.S. and in September for Canada, the company hasn't yet gotten a handle on the exact cost savings and productivity gains. But as staffers in the Grand Haven office will attest, the project is most definitely paying dividends.

And the ability to help different offices fill positions is only the beginning. Another key capability that will come from the new centralized, consolidated data warehouse is enhanced billing.

and invoices go out to customers by the end of the week. That has cut by 10 to 15 days the lag time between when Olsten pays employees and when customers pay Olsten, Harding says.

Reporting capabilities have likewise taken a quantum leap forward with the addition of report-generation tools from Cognos. Each customer can dictate what metrics it wants to see and how the data should be arranged. It's also now easy to produce impromptu custom reports, Guillerault says.

The next step is implementation of reports that Olsten managers can use to learn about productivity and other operational metrics. At that point, Olsten will be able to better quantify the benefits of the Precise project. "We're still sorting through how to take full cost advantage of the systems we've implemented," Harding says.

There are hard cost savings, however, from things such as reducing fax costs by using e-mail instead, and from sending memos and training materials via the intranet instead of on paper. "Paper savings alone are in the half-million-dollar range per year," Prill says.

More to come

As Olsten tweaks business processes and reporting mechanisms to squeeze every bit of benefit out of Project Reach, it's also working on enhancements for customers.

While Project Reach allows for new levels of automation and communication for Olsten employees, and provides for better customer service, it still requires significant human intervention for order placement. Customers typically call a branch and explain what they need.

"A lot of our bigger customers want to place orders online, so we're investigating using extranet and Internet technologies to do that," Prill says. The same goes for reporting and checking on orders in progress, he notes. The goal is for customers to be able to do all that online, on their own, whenever they want.

At the same time, Olsten is exploring how to use XML-based transactions to present bills to customers and get payments back.

The application architecture to support each of these initiatives is already in place, and the company is now at work designing the supporting infrastructure. B.


Olsten CIO James Harding says the company moved to a successful network architecture with World Fusion.
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1999 USER EXCELLENCE

Award Winner

OLSTEN STAFFING SERVICES

Primary business:	Placement of temporary employees
Project name:	Project Reach
Business case:	Provide better customer service and support, as well as support continued company growth.
Cost:	Not saying, for competitive reasons, but 3Com infrastructure alone cost at least \$3.5 million and Sun servers cost upwards of \$4 million.
Benefits:	Improved collaboration among field offices in fulfilling customer orders; improved reporting and billing; shortened lag time between employee payments and customer



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Grade-A network

Western Heights School District teaches that a unified network can be built today. *by Julie Bort*

Leave it to the schools to teach the world about converged networks. While many an industry pundit has declared the task unworkable, a K-12 school district in Oklahoma is proving it can be done, and done now.

Western Heights School District in Oklahoma City has spent the last five years and \$8 million in E-rate and bond money building "JetNet" — its aptly named converged Gigabit Ethernet backbone that does it all: voice, videoconferencing and video broadcasting, as well as storage-area networking.

"We think of technology as something that helps us teach, but technology itself is a basic skill. We've got to keep the best technology in place at all times so our students can learn it," explains Joe Kitchens, the district's superintendent and network visionary.

Still, Kitchens didn't launch this project intending to build one of the nation's most advanced end-user networks. His goal was to develop better teaching methods. In 1994, two years before the district would begin to deploy JetNet, Kitchens commandeered a 24-member committee to examine how technology could help educators. That committee, comprising teachers, administrators, students, parents and local businesses interested in the eventual talent pool, came up with a list of goals. Top on the list was putting several computers in every classroom.

"In any given class of 20 to 30 kids, there are four or five different learning styles. We imagined kids coming in and sitting down at a computer and getting information in the manner that helps them the most," explains Daryl McDaniel, information technology coordinator for Western Heights, who with a staff of four and three outside consultants built and maintains JetNet. Those who learn through audio would have multimedia. Those who learn best through repetition would have a tireless companion to perform the same task a multitude of times, and so on.

Moreover, the committee envisioned PCs functioning as teachers' aids, offering supplemental lessons tailored to students' developmental stages. For grade-school children, who are "dependent learners" — meaning they need someone to show them what to do — Western Heights wanted video lessons. For junior high and high school students, who are working toward becoming "independent learners," district leaders wanted a wider variety of independently paced lessons, supplemented with video when needed.

But the meager network Western Heights had could not support these lofty goals. Before JetNet, Western Heights had two small networks that connected 10 computers, mostly Apple IIe machines used by administrators. Teachers and students used another handful of stand-alone Apples.

By 1995, committee members realized that the first step toward meeting the technology goal was to wire every site. They wanted five network connections for each classroom, plus a computer lab for each school.

"The computer lab was mostly for mass training of teachers. They needed to be brought up to speed — 80% had absolutely no training at all on computers, so we concentrated on the labs first," Kitchens explains.



JOSEPH MILLS

Daryl McDaniel, information technology coordinator, and Joe Kitchens, superintendent, make learning a happy — and networked — experience for Western Heights School District students in Oklahoma City.

Also at that time, Kitchens set about learning more about networking. His inspiration for building a single network for data, voice and video came while listening to Intel Chairman Andy Grove preach convergence at a technology conference. Although the rest of the world raised skeptical eyebrows that have yet to be dropped, Kitchens says he vowed then not to do anything until convergence materialized.

He was convinced that convergence was the future. By investing in one set of wires, the district could build a data and voice network simultaneously.

With convergence as a guiding goal, Western Heights took the practical step of hiring three consultants. One was a telecom engineer who knew wiring specifications. Another was an architect who helped retrofit each building to accommodate the wiring and the computer labs. The third was an emerging-technology specialist who explained what could be done immediately, and how to plan for new technology as it became available.

Until 1996, JetNet was a 100M bit/sec Ethernet wiring project — with community backing. Voters approved a \$4.5 million bond in 1995 that was dedicated to implementing this basic infrastructure, Kitchens says.

The next wrinkle was laying the fiber among its eight campuses. The district didn't have all the necessary property rights. So it struck an agreement with the local power company, Oklahoma Gas and Electric. In

exchange for letting Western Heights use its easements for fiber, the utility company shares the bandwidth.

Through this agreement, the district interconnected five sites with self-supporting single-mode fiber, suspended on utility poles. The remaining three sites were adjacent to each other,

allowing the district to bury multi-mode fiber on land it owns.

Over the course of three years, the community would pass two more bond issues for JetNet, for a total of \$6.8 million in funds. An additional \$250,000 came in federal funds, and another \$1 million was raised by the

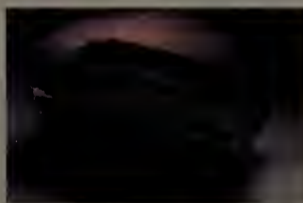
FCC-regulated E-rate program. (A fourth bond issue, which would allocate another \$1.2 million to JetNet, hit the ballots in October. With the matching E-rate money that such a bond would allow Western Heights to pursue, JetNet's projected budget to date is \$10 million.)

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QUICK LOOK

WESTERN HEIGHTS SCHOOL DISTRICT

Primary K-12 education.
business:

Project JetNet
name:

Business case: A converged network that the district supports for local and distance learning on the same fiber with which they access the Internet and e-mail services, Web, telephone calls and run data applications.

Cost: \$8 million

Benefits: Lets students learn by their own methods while teaching about technology.

By 1997, the year-old JetNet was the district's portal to the world, linking up with the state's Internet connection. By 1998, it began to host the video its architects dreamed of four years earlier. And in 1999, with the installation of a storage-area network (SAN) and a gateway that allows phone calls to be generated from teachers' PCs, JetNet was a truly converged network.

Today, JetNet is a gigabit backbone that connects the eight sites over 17 miles using fiber optic cable that terminates at the main campus. From there, JetNet connects to OneNet, an OC-48 backbone that links Oklahoma's educational and government agencies to the 'Net. This connection has let students and faculty use the Web for research and to build their own Web sites.

JetNet supports 3,500 end users with 1,470 desktop computers and 30 Dell PowerEdge servers. A handful of these servers are dedicated to authentication, network management and e-mail. The rest are clustered to handle the district's advanced video needs, some fielding satellite feeds. JetNet communications are handled by Intel Gigabit Ethernet switches; the district has been beta testing the company's 6000 Series Switch.

Also, a central Dell SAN will be tapped for streaming video. The district is acquiring and filming its own video lessons — with this SAN, it can offer 40 to 50 video lessons per class, at 20G to 25G bytes of storage for each lesson. Teachers already have more than 2,000 hours of stored video to choose from, "with room to grow," McDaniel says.

In fact, McDaniel worked with Dell to create a RAID Level 5 SAN design that could cluster and scale with hot-swappable disks over a 4G bit/sec uplink to the network. The result is a

Continued on page 106

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Continued from page 104

SAN that creates nine logical unit numbers (LUN) with nine global hotswappable spare drives that can service any LUN inside the SAN, McDaniel says.

"Each video server can only pull

from one drive, so we have combined the LUNs to create four volumes. Thus each server has its own 'drive' from which to pull video. When Dell supports RAID Level 3... Western Heights need only make a few minor changes to its current disk usage to be compliant," he explains.

Every classroom has five Category 5, 100M bit/sec Ethernet connections. While not every drop is filled today, Western Heights plans to have 2,200 PCs total, to serve 3,300 students, 230 teachers and 15 administrators.

Each class also has at least two PCs running Windows NT 4.0 — one is a

dedicated teacher's workstation — and a 27-inch television, which connects to the network for video broadcasting.

Teacher's PCs are equipped with Intel's ProShare 5.1 videoconferencing software and Cisco's IPTV client, so they can conduct live conferences with other ProShare-equipped machines and stream video over the LAN. Videoconferencing over the 'Net requires ProShare with Videoserver Encounter NetGate; classes can be videoconferenced to as many as 28 end points. Western Heights conducts three videoconference classes daily between the middle school and high school. Both schools have labs with ProShare PCs.

"We eventually see our students on cable modems, able to do videoconferencing, reviewing lessons at home at night, doing make-up classes and accelerated classes. Schools have got to become more flexible and move to become 24-hour institutions. They can't just be the six- to eight-hour institutions they've been," Kitchens says.

NOTABLE FACT

The 3,500 users supported by JetNet access 60,000 to 70,000 Web pages per day.

Teachers can also use their PCs to place outbound voice calls to any phone. This is supported via ProShare, two ISDN Primary Rate Interface lines, Cisco's 3600 series multiconference server along with Cisco's AS5300 access server.

"ProShare is set up to register itself with the 3600 router. This allows teachers to place a call by dialing the person's e-mail address instead of having to know the NetBIOS name of the person's computer," McDaniel explains.

The multiconference server also is programmed to recognize POTS calls and to redirect such calls to the AS-5300. The AS5300 then dials the call over one of the 46 phone lines provided by the two PRI connections. Next, the district plans to integrate inbound calls and voice mail onto JetNet, as soon as its conferencing system vendors can accommodate that feature.

While it's hard to measure how such a network has increased teaching effectiveness, Kitchens says that national test scores are on the rise for the district, in part because of JetNet. "I could not say that the gain is attributable only to technology. But we do know that our students are leaving this school system better prepared to deal with technology," he says.

As Western Heights graduates onto its next network goals, one thing's for certain: In its willingness to venture onto the jagged cliff edge of technology, it mentors us all. B.

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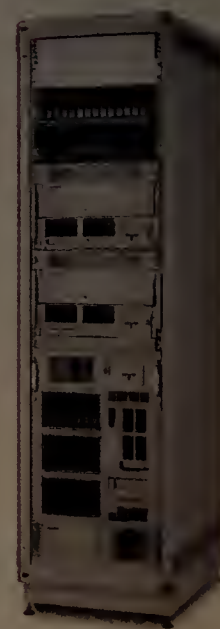




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Perfect fit

Adding voice to a new frame relay network was an ideal choice for U.S.-Mexican industrial products joint venture Trottner-McJunkin. by Joanie Wexler

You know the drill: Two companies join forces and — bam! Suddenly they have an urgent need to integrate their disparate information systems. The enterprises then scramble to figure out how to make their systems and networks interoperable.

A silver lining sometimes appears for this cloudy IT challenge: Such projects have been known to uncover opportunities for creating new operational efficiencies while the company is back at the network drawing board.

Just ask McJunkin Corp., an 80-year-old, 1,600-employee U.S. distributor of industrial products and a winner of an honorable mention in Network World's 1999 User Excellence Award competition. The Charleston, W.V., company formed a 50-50 joint venture with Casa Trottner, S.A. de C.V. in Mexico City earlier this year and wound up making network improvements that reaped benefits beyond the new venture's immediate data connectivity goals.

McJunkin and the smaller Casa Trottner figured that by combining their complementary inventories and by leveraging their prominent brand names in their respective countries, they could each easily grow their revenues while establishing an international presence. "We thought this was a better business approach than both of us being the new kid on the block in a new country," explains Larry Shank, McJunkin's computer operations manager.

First SNA, then voice

The business goals of the venture required that each partner open a portion of its mainframe-based applications and data to the other in a kind of "SNA extranet." Both companies were already running leased-line networks among their own corporate sites. The challenge was to introduce the connectivity required to give each partner access to the other's inventory data and pricing information, says Lisa McClain, McJunkin's network manager.

One option, of course, would be simply to string more leased lines from the Mexican sites to McJunkin's Houston distribution center. But that was an expensive proposition considering the international nature and distance of the links. The venture decided a U.S.-Mexican frame relay network made more economical sense than investing in additional private lines.

While they were at it, McJunkin IT staffers analyzed the cost of the company's 100-site domestic leased-line data network. They replaced



Larry Shank, computer operations manager, and Lisa McClain, network manager, stand watch over a cross-border voice-over-frame relay network for industrial products distributor McJunkin Corp. and its Mexican partner.

all the existing leased lines with 64K bit/sec and T-1 frame relay private virtual circuits (PVC) and added a frame relay link from Trottner's Mexico City site to McJunkin's Houston location, which is serving as the hub for the venture. All the Mexican sites can access Houston through that frame relay link.

Then the team turned its attention to voice.

"When we started looking at the long-distance voice charges we were incurring between Mexico and Houston, we decided to research ways to integrate voice onto the network," McClain says. "We knew voice-over-frame relay standards and technology had settled, so we decided to explore that possibility."

All three entities — McJunkin, Casa Trottner and the new Trottner-McJunkin venture — are now running a frame relay network for data using services from AT&T. A hub site in Houston connects a 100-site U.S. WAN to a six-site Mexican WAN. For international voice calling, the venture combined voice and fax onto the frame relay links between the Houston hub and five Casa Trottner locations in Mexico: Coatzacoalcas, Culiacan, Guadalajara, Mexico City and Tampico. A Trottner distribution site in Caracas, Venezuela is slated to soon join the integrated data/voice frame relay network.

All Casa Trottner and Trottner-McJunkin intracompany voice south of the border has been integrated with data onto the frame relay net-



work. Voice-enabled frame relay sites run Nuera Communications F-50 or F-120 voice frame relay access devices (FRAD), along with Sync Research data 3600 and 4600 series FrameNode FRADs, which are installed at all McJunkin and Trottnier sites.

Piggybacking for savings

For now, McJunkin in the U.S. still uses long-distance services from AT&T for voice. But the Mexican sites link to the Houston hub via frame relay, then piggyback on Houston's PBX to initiate voice calls over the public-switched telephone network

(PSTN) at U.S. calling rates. The 10-cent-and-below per-minute U.S. long-distance rates shave about 68% off the price of calls to the U.S. originating in Mexico, says Dan Sheinberg, president and CEO of Trottnier-McJunkin.

Sheinberg estimates that throughout Mexico and the U.S., Trottnier is

cutting about 10% off what was a \$17,000 monthly telecommunications bill overall by putting its telephony traffic on the frame relay network and piggybacking on the Houston PBX. These calculations take into account monthly frame relay equipment lease costs and monthly recurring frame relay service charges.

"We have installed a service where we know exactly what we will pay, and there will be no increase in our bill regardless of how much we use the service," Sheinberg says. Unlike in the U.S., he explains, telecommunications prices in his country are escalating every year. Because there is only a single local telephone company in Mexico (Telefonos de Mexico, or Telmex), competition has not yet resulted in lower prices, he says.

Speed: The name of the game

In addition to cost-savings, Trottnier-McJunkin also focused on response time of SNA applications. "SNA was

NOTABLE FACT

Mexico recently gained the capability to complete calls to U.S. "toll-free" 800 numbers at a cost of 50 cents per minute.

and still is our bread-and-butter protocol, so our major criterion for a new network was faster response times [because of SNA's low-latency nature] and cheaper circuits," McClain says.

However, she adds, the company knew that TCP/IP applications were playing an increasingly larger role in its business processes, to date accounting for about 25% of the company's traffic. "We needed a device that could handle both kinds of traffic," McClain says.

Frame relay has long been successfully used for interconnecting LANs running protocols such as IP, generally slashing monthly carrier charges by 50% compared with long-haul leased-line networks. Within the past one to two years, frame relay has also become a popular alternative for SNA traffic as network service providers have begun offering standard service-level agreements (SLA) on network performance metrics such as uptime, latency and packet loss. In addition, some carriers offer "priority PVCs" — virtual circuits that customers can dedicate to time-sensitive traffic such as SNA or voice.

Because subsecond response time for its SNA and voice traffic was critical, McJunkin tested several vendors' FRADs, as well as routers with integrated frame relay interfaces from the major players, with various services. "We discovered that Sync Research FRADs delivered the best response times for our SNA-heavy environment," says McClain. The devices also include quality-of-service traffic prior-

Continued on page 112

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Continued from page 110

itization capabilities for blending delay-sensitive traffic such as SNA with more tolerant IP and LAN traffic on a combined link.

McJunkin set up and paid for live production testing of multiple pieces

of equipment using frame relay circuits from AT&T, as well as a combined network from Bell Atlantic and Intermedia Communications. The test network linked the Charleston headquarters to Charlotte, N.C., and Hurricane, W.Va.

In the tests, McJunkin discovered that traffic passing through a Network-

to-Network Interface (NNI) between two frame relay service provider networks suffered from delay. "Some people would say I'm being picky, but we need subsecond response times. With 1,200 people on a circuit, the difference between one second and seven-tenths of a second is significant to us,"

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QUICK LOOK

TROTTNER-McJUNKIN

Primary business: Distributor of pipes, valves, fittings, steel and other industrial products.

Project name: Not applicable

Business case: When joint venture partners combined inventory and sales teams, they required access to one another's data systems. Integrating international voice and fax traffic onto a cross-border frame relay service let the partners accomplish data connectivity goals while reducing international telephony bills and overall network costs.

Cost: About \$175,000 (one-time capital investment)

Benefits: Reduced overall data network costs and international telephony charges; reciprocal access to one another's data systems.

Shank says. "AT&T was about the only carrier that didn't have to use an NNI to provide us with the international connectivity we required."

In addition to SNA's sensitivity to timeouts, "we were a little concerned about quality of voice," Shank acknowledges. The company settled upon voice-over-frame relay access equipment from Sync partner Nuera Communications based on test results and confidence in Sync's recommendations from past projects. "At first, the voice took a bit of tuning, but it is running at toll-quality now," Shank says.

Meanwhile, the Trottner-McJunkin venture has installed Sync Research Frame Relay Access Probes (FRAP) — also called smart DSU/CSUs—at key sites so that it can actively monitor network performance metrics and usage statistics of each link.

Staying on top of its usage patterns and application performance using the smart DSU/CSU tool puts McJunkin network managers in control of their users' destiny. They can discover in real time, for example, if and when committed information rate on a given PVC needs to be increased and how new applications joining the network affect existing traffic.

The Trottner-McJunkin cross-border frame relay network, now about six months old, is on track to save the firm \$75,000 compared with leased-line circuit charges this year. The new net is expected to save the firm \$225,000 in the third year, McClain says.

At the end of the day, the equation is fairly simple, says Trottner's Sheinberg. "We're getting more capabilities, and we're paying less money." B.



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Batting 1000 with business managers

Five tips for making sure business managers consider you part of the team. by Suzanne Askren

For one department at the corporate office of Longs Drug Stores in Walnut Creek, Calif., the idea seemed simple enough: Buy a two-tier client/server Novell network, install it and let it run. That would have worked fine, except Longs relies on a thin-client model and uses Windows NT for naming. Chatty IPX packages being issued to the WAN didn't hold much appeal for Brian Kilcourse, senior vice president and chief information officer.

Kilcourse would have preferred to work with the department on alternatives, but was a victim of timing. "We didn't find out about the plan until the network was almost installed," he says.

This story isn't new to any network executive. And at least Kilcourse found out before the implementation. But since companies depend on their networks for their livelihoods, the network must be protected. Getting on a business manager's team during the early stage of planning is critical.

But business managers often view IT as a post-implementation support department. Yet success lies in establishing and maintaining good relationships. Here are five tips to help you accomplish that.

1. Show your business sense

Consider this the groundwork for long-lasting relationships. In today's bottom-line times, business managers will be most responsive if you intimately know your company's business.

"That's the first point to gaining acceptance with other managers: Understand the company's business first, rather than being preoccupied with the technology," says Johannes Zeigler of Synesis, a strategic management services firm in Palo Alto.

Kilcourse agrees. "We ask our IT managers to spend time in the users' areas, and in stores and warehouses," he says. "You really get to know the issues that way."

But it's not enough to know it; you also have to view yourself foremost as a manager, Zeigler says.



"In many cases, network executives do their staff's job, playing the role of the technician or the engineer and even doing implementations," he says. "Then they're not sought out by other departments because people think of them as being specialists, and not managers to go to for advice."

By focusing more on their jobs as managers, not only will other managers take note, but network executives will also find that they have freed up time that can be spent with other business managers, Zeigler adds.

2. Check your attitude at the door

Sure it's frustrating to find out a department has deployed a nonstandard system. But how you handle the situation will determine if departments approach you for early buy-in the next time.

"You can take two different approaches," says Ken Brame, senior vice president and CIO at Service Merchandise in Brentwood, Tenn. "You can be viewed as, 'Here are all the reasons you can't do what you want to do.' Or you can be viewed as, 'We want to accomplish what you want to accomplish, and here's maybe some alternative technology that can do that.'"

If department heads still insist on doing things their way, Brame whips out the cost/benefit analyses. He tells them that support costs will be significantly higher if they go off on their own, then gives them that option. The caveat is they must cover these higher costs.

Kilcourse says Long's IT staff never says no to departments. "We let the business manager understand the implications and make those decisions."

By focusing on education, you're letting others know you are a partner

who is there to help. The more you help — even after the fact — the more you can prove your value and improve your relationships.

"We've been able to demonstrate successfully to department managers that they're better off to have us involved," Kilcourse notes.

Once business managers know that, they'll be calling you routinely for new projects — and earlier.

3. Form a committee (really!)

For some companies, particularly larger ones, using an IT project steering committee provides a way to stay

tuned in.

At Toronto-based Apotex, Canada's largest drug manufacturer, a 14-member senior executive IS steering committee meets monthly to prioritize and approve requests, says Michael Davidson, CIO. Any project that will take longer than 30 days in duration

must pass through this committee. As a result, network-threatening surprises are minimized, Davidson says.

Similarly, Service Merchandise has an executive committee that meets bi-monthly. Because all hardware and soft-

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IT managers at Longs Drugs are required to spend time at stores and warehouses so they better understand business objectives, says CIO Brian Kilcourse.

ware must be approved before purchase, the committee can keep tabs on projects that could affect the network.

Other members of the committee are senior vice presidents from departments such as marketing and warehousing. This gives Brame exposure and valuable face time. "Fortunately, part of being on the executive committee is interacting with people on a regular basis," he says.

Brame also has his managers meet with an assigned business manager. This has helped develop what Brame terms "close working relationships" between his staff and business managers.

"When we started, we had to be proactive about it," he says. "But once you have mutual respect, as many calls come this way as go out."

4. Communicate creatively

Sometimes creativity is needed to snag face time with managers. That could include the drastic action of loaning out your own employees for free.

That's what one executive of a medical device manufacturer did when he recognized IT was out of touch with its manufacturing distribution center, says Tom Oser, an executive with the global electronic commerce consulting team of Ernst & Young in New York.

"He took a half dozen of his people and placed them in the operational business units," Oser says. "He lent them on order of six months at a time, and they all had rotations through the business units."

Because the employees were assigned to jobs by business unit vice presidents, the units could use the employees in any way they saw fit.

"All of sudden, IT became a real presence." Continued on page 118

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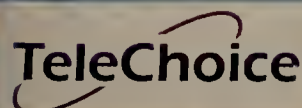
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Continued from page 116

ence. It went miles in cutting the distance between them," Oser says.

If it's not possible to loan out employees at no charge, both from a budgetary or organizational standpoint, try volunteering some consult-

ing services for specific projects instead. This works well in less formal companies that may resist the structure of a steering committee.

John Gambriel chose this tactic when the U.S. Department of Agriculture's procurement department began implementing a new procure-

ment system. "I offered up my services as a technical consultant, and I'm helping it forge relationships with the technical engineers here," says Gambriel, program manager for telecom and infrastructure. "Then I know from both sides of the equation what's going on."

Beyond that, Gambriel suggests try-

ing to maintain an advisory relationship with upper management.

"Keep the channels open and let them know you are available to help and advise," he says. "Otherwise, they don't realize the expertise is available."

5. Take advantage of e-commerce

The high visibility of e-commerce translates into high visibility for network executives within the company. CIOs and CEOs have had their wake-up calls; they realize that the network now has a direct effect on the revenue stream, says Jorge Garcia, director of Arthur Andersen's national network solutions practice in Atlanta.

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Network executives can use their e-commerce experience to their advantage in forging relationships, pointing out that they must be included in planning all IT-related projects — even those that department managers deem trivial. The reason: All managers must work together to protect the network — and the revenue.

As Zeigler puts it: "E-commerce is an ideal example of technology that directly translates into the business," and proves how technology affects the bottom line. That can be used "to draw more attention to networking," he adds.

E-commerce is also something all departments can relate to because it's revenue-generating. That can put you on the same playing field with business managers in other departments. And that can go a long way toward them viewing you as a peer, rather than as an after-the-fact support organization.

At Longs Drug Stores, e-commerce has meant electronic data interchange throughout most of the '90s. But e-commerce and the Internet is changing IT's function in the company in subtle but fundamental ways, Kilcourse says.

"How to add value with content through digitally based services crosses over in a big way to business. It's fundamentally an IT issue," he says. "We are not driving the issue, but we're certainly up there with the rest of the departments. And we are providing the vision with what's happening."

With some strategic effort, that vision will be increasingly relied upon by management throughout your company. Better still, you will reap the rewards as the network is protected — and senior management sees your vision reflected in the bottom line.

Askren is a freelance writer in Evanston, Ill.

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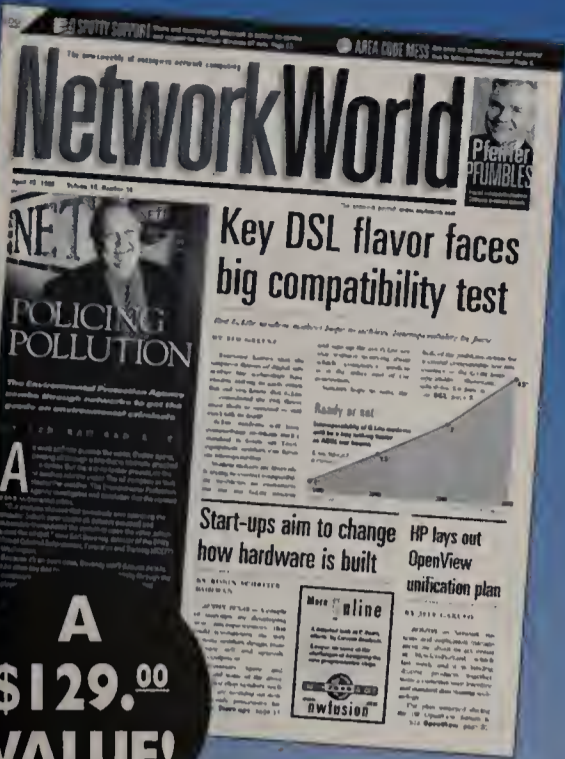


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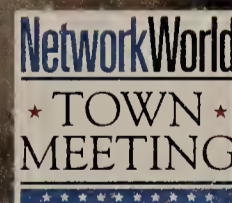
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Moderators

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David Hill, *Senior Analyst, Storage and Storage Management, Aberdeen Group*

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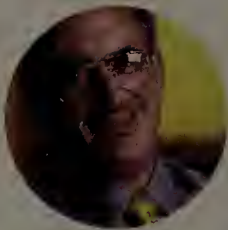


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The best of the best



Yankee Group President Howard Anderson tells us what makes a product great.

Every week, 30 companies parade through The Yankee Group, each proclaiming that its product is "The Best." The CEOs stand in my conference room swearing that the product is "so good, we don't really have competition." Then they modify that by admitting, "Well, we might have some competitors, but we're kicking the crap out of them."

Yeah, right.

But the idea of "The Best" is intriguing. Clearly a product can be best for only some set of time before it is either eclipsed by the competition or by the company itself. "Good" products might be The Best for, oh, 4 or 5 nanoseconds. "Great" products are usually The Best for several years. They define the category.

I've got examples galore. Action Communications System's WATSBOX, the first least-cost routing system, was far and away The Best product of its genre: It let communications managers cram seven hours per day — not four — on a dedicated line. VMX's voice mail invented the category; that technology eventually was ported to every PBX manufacturer as well as the central office equipment vendors.

We learned early on that the user community could adopt a best product and build on it. Northern Telecom's Meridian SL-1 PBX was the first all-digital switch with the features the market needed. It vaulted Nortel to the front of the pack. Meantime, AT&T resisted adding least-cost routing because it was afraid it would result in lost long-distance market share. Its competition didn't have that concern, and AT&T lost 60% of the PBX market. Major rule: Don't hobble your products.

The Best products not only make a user look smart, they can build an industry. Cisco's AGS Plus was the first corporate multiprotocol router; it made the company. The Cisco 12000, a carrier-class high-performance router, positioned the company as a provider of software-based products, not just hardware. Cisco's Kalpana Ethernet switch legitimized LAN switching.

Sure, some products are The Best because they hit that sweet spot between value and functionality. Apple's early portable com-

puters weighed 23 pounds and had a form factor only a masochist could love. But the early PowerBooks were fantastic, and the Apple operating system was The Best for 10 full years. The Apple Newton, on the other hand, was flawed from the minute it was introduced. The 3Com Palm V may endure as an "insanely great" product for six months — until I can get my hands on a Palm VII.

What makes a product great?

1. It forgives without penalty changes its vendor makes. In other words, it has a life of its own: IBM's 360 PC family.
2. It works well with other products of the same design, so your investment is not trashed prematurely: SAP R/3 enterprise software.
3. It returns substantial and continuing economic benefit to the user. On an internal rate of return basis, it shows 50% to 75% return per year: IBM's PC; Digital's PDP 8 computer.
4. Users need virtually no instruction: Microsoft PowerPoint.
5. It becomes the standard: Motorola StarTac portable phone.
6. It creates a better way: Novell NetWare; Network Equipment Technologies' T-1 multiplexers; 3Com adapters.
7. It lets applications that were not previously possible thrive: Lotus 1-2-3; Lotus Notes.
8. It builds and supports standards so the user is not forever mucking around: TCP/IP.
9. It's elegant in design, sparse of gimmick: Hotmail Web e-mail.
10. It continually rewards users for making that choice, building fanatics: Check Point Software's Firewall-1.

Bottom line: "The Best" may be an illusive term, but we all have experienced such products. Great companies don't start out great by themselves, they begin with these insanely great products. The designers won't compromise; they strive to outdo themselves and won't settle for me-too products.

So to all you vendors besieging The Yankee Group, a word please. Spend a little less on your PR flacks and a lot more on your product design. Do great work and build The Best products. Why else are you here?

Anderson is founder and president of The Yankee Group, a Boston-based consultancy. He can be reached at handerson@yankeegroup.com.

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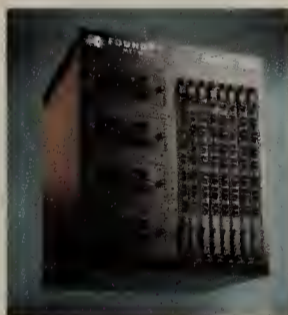
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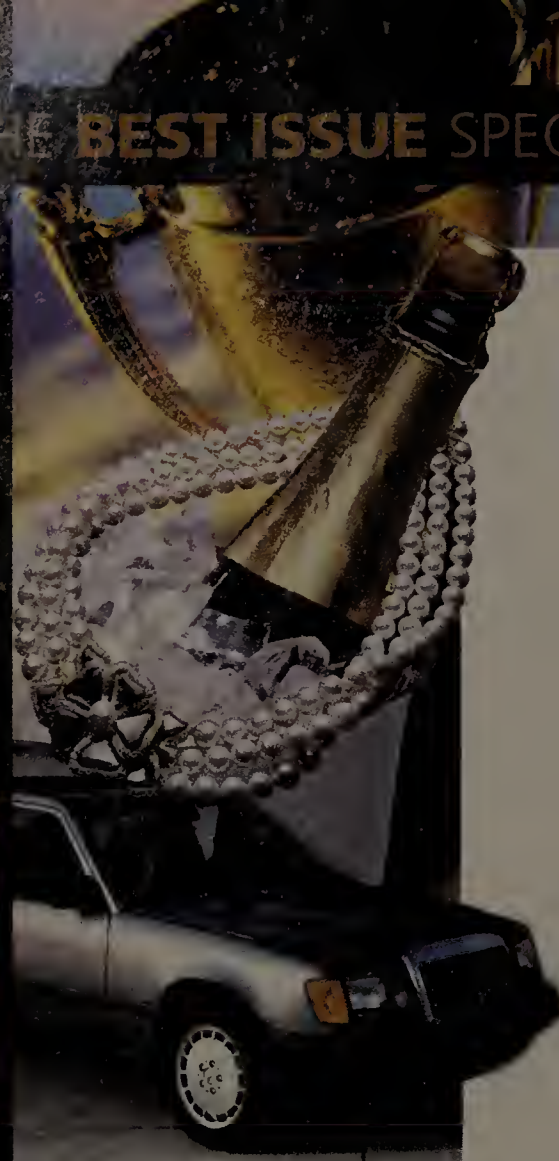


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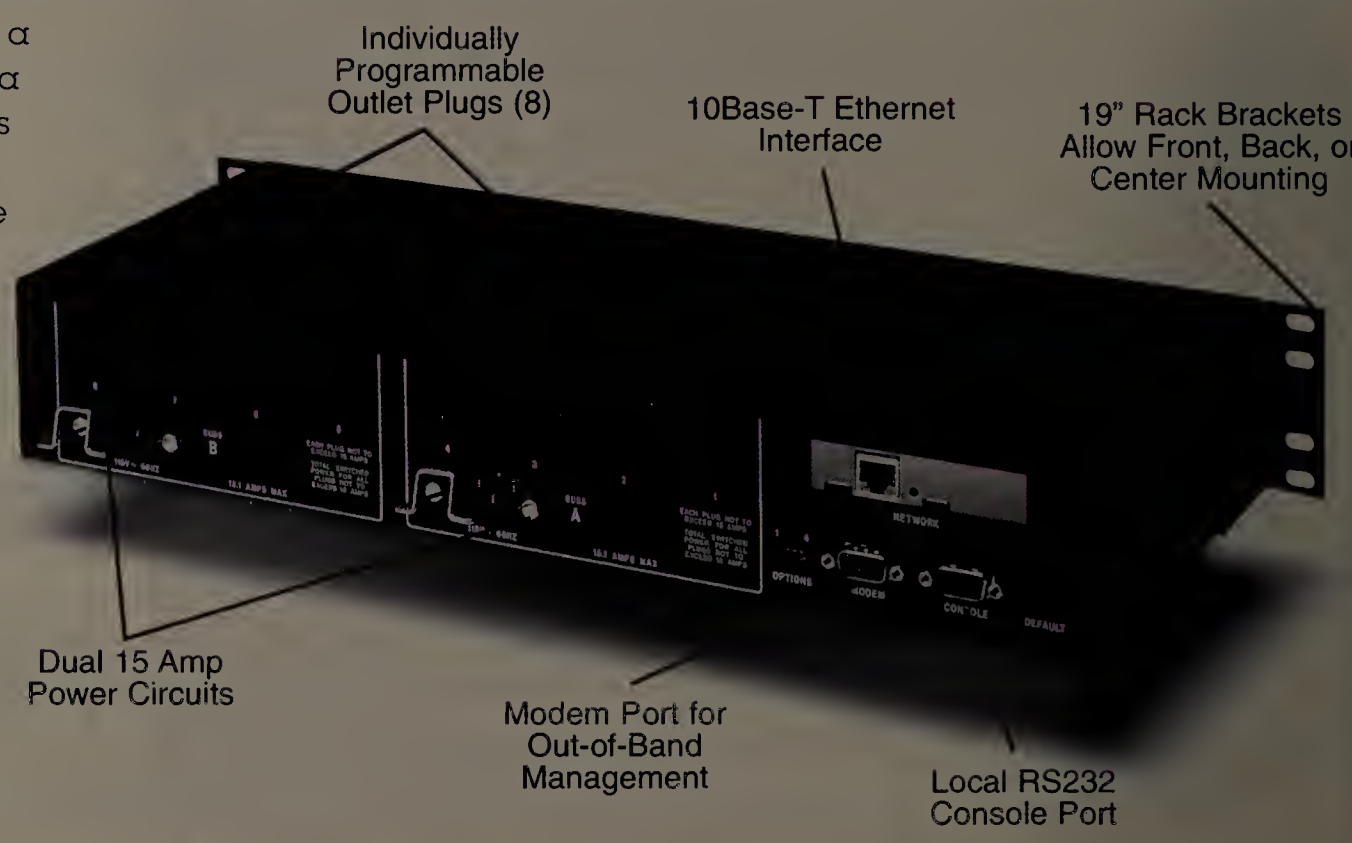
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KVM Networks™

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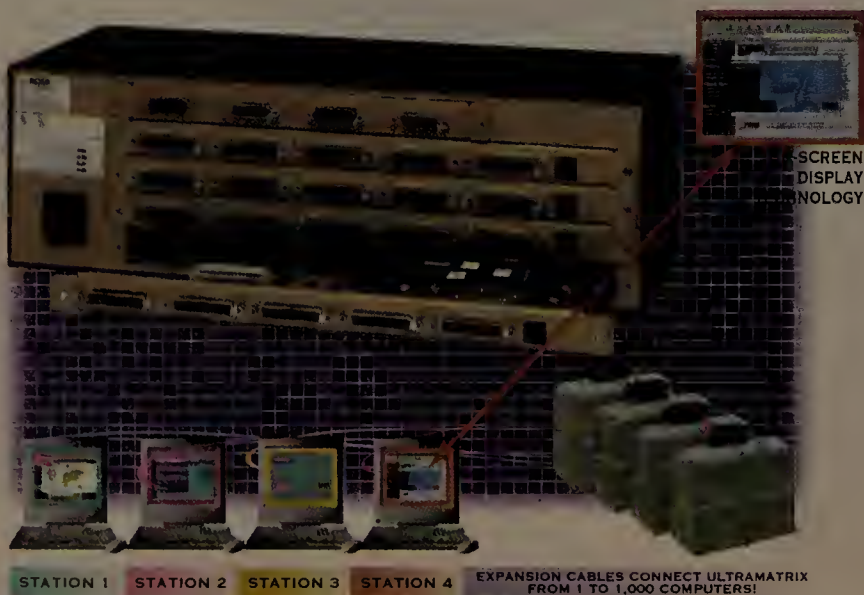
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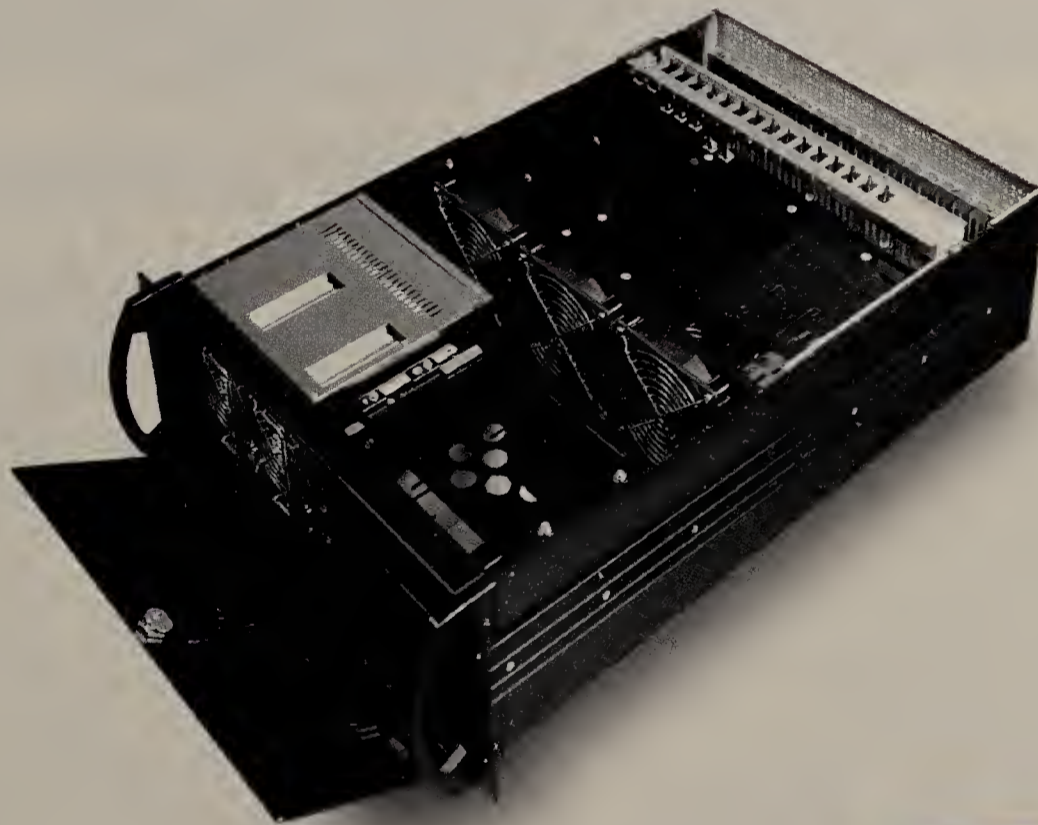
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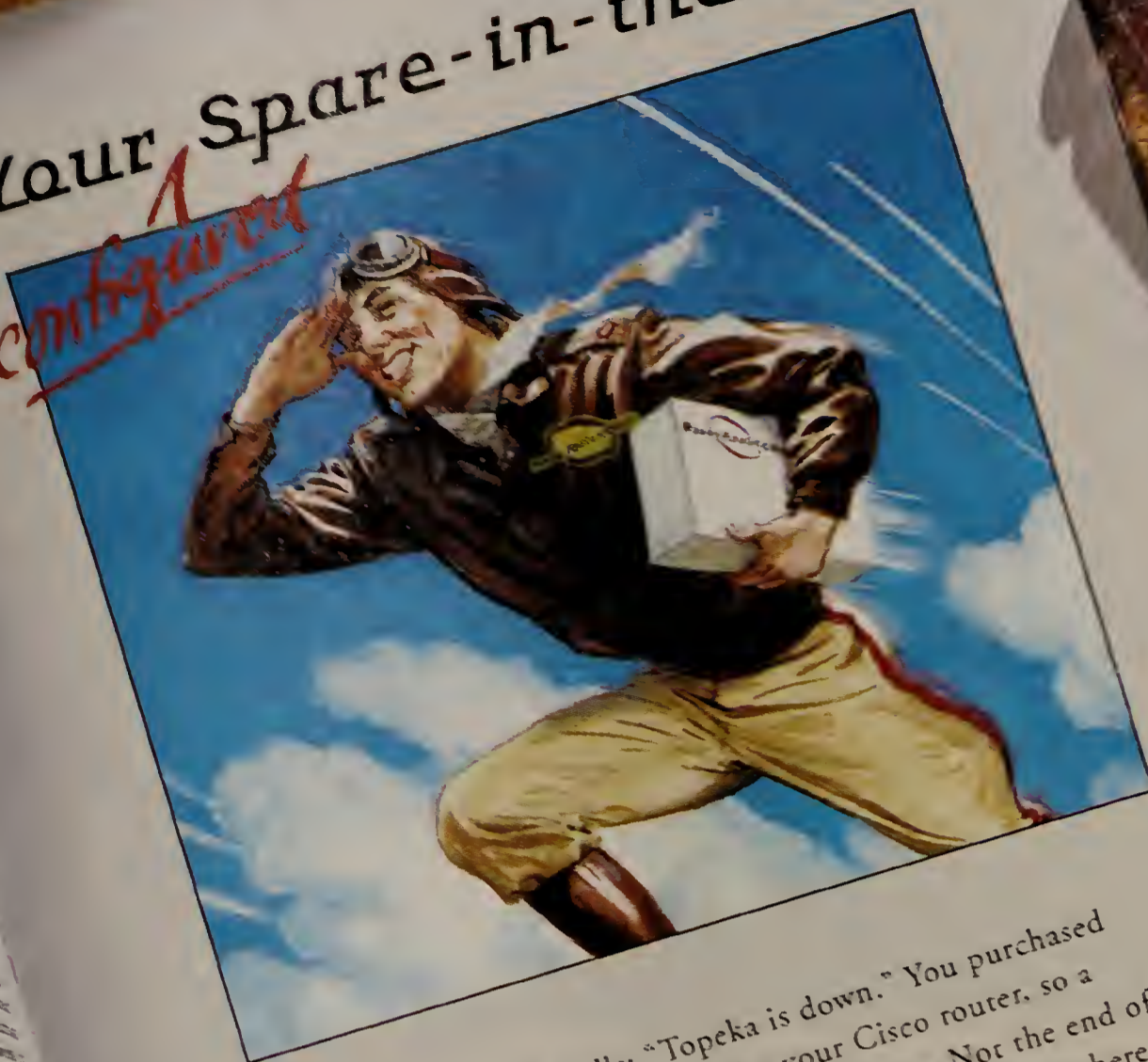
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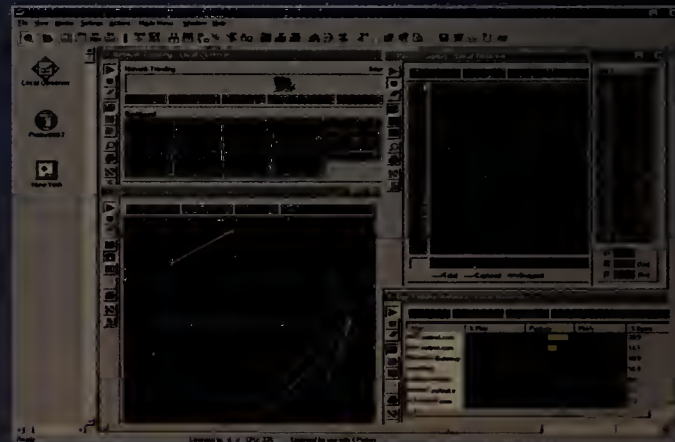
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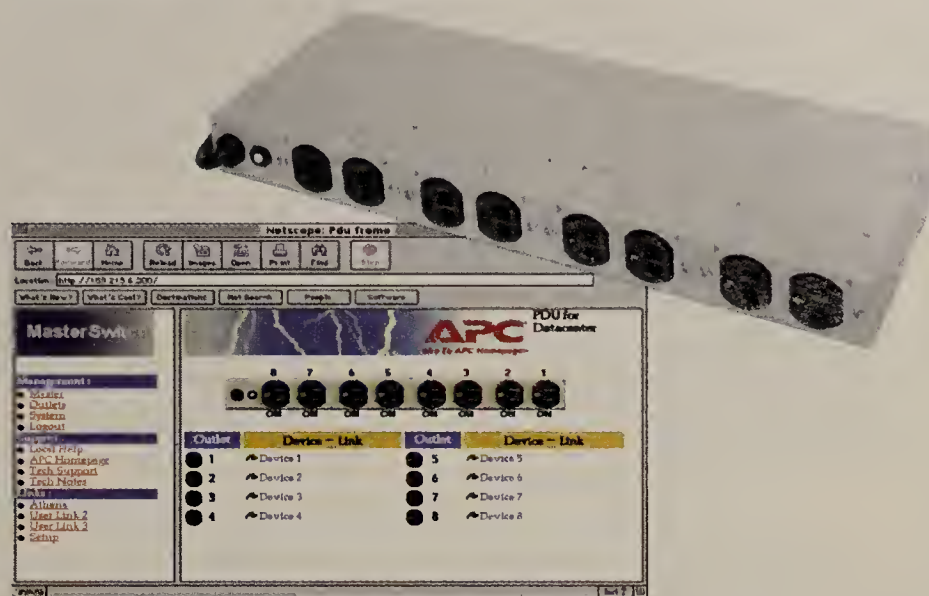
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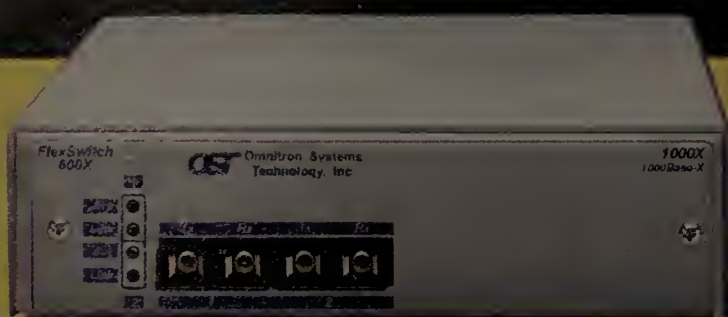
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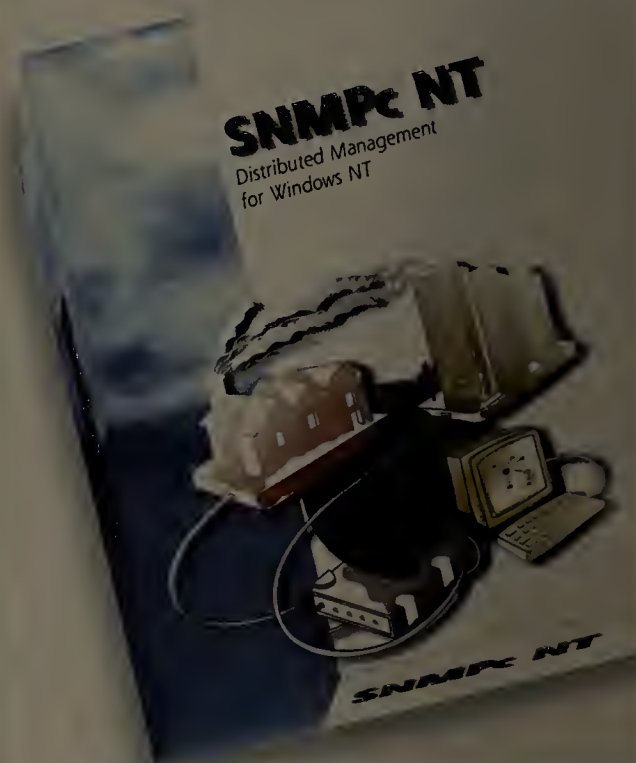


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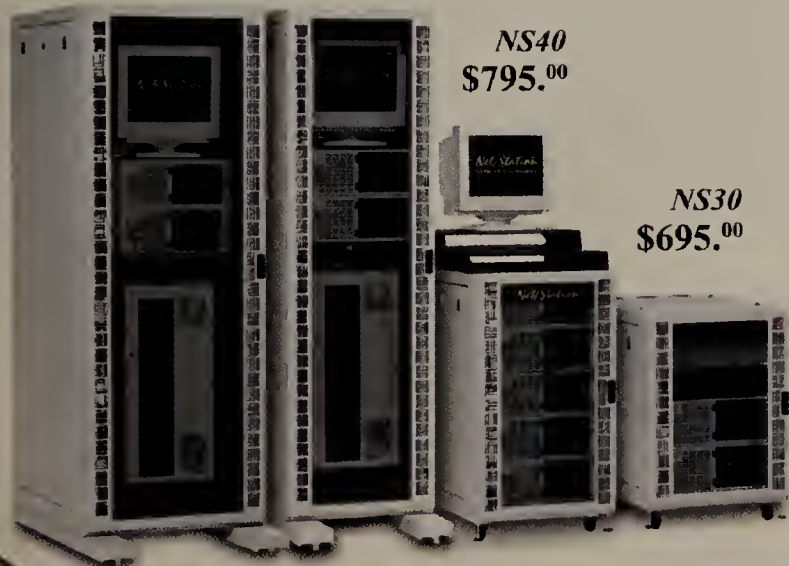
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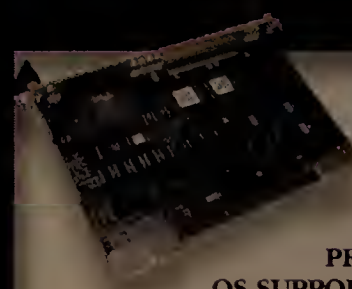
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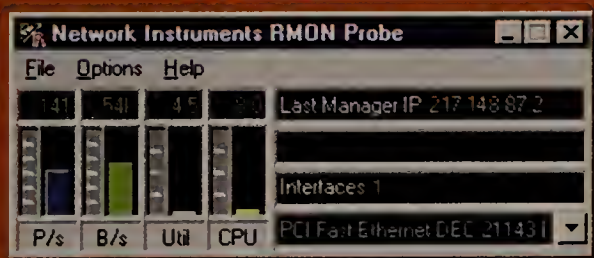
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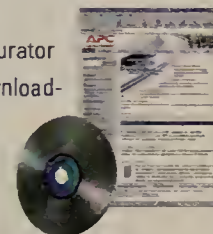
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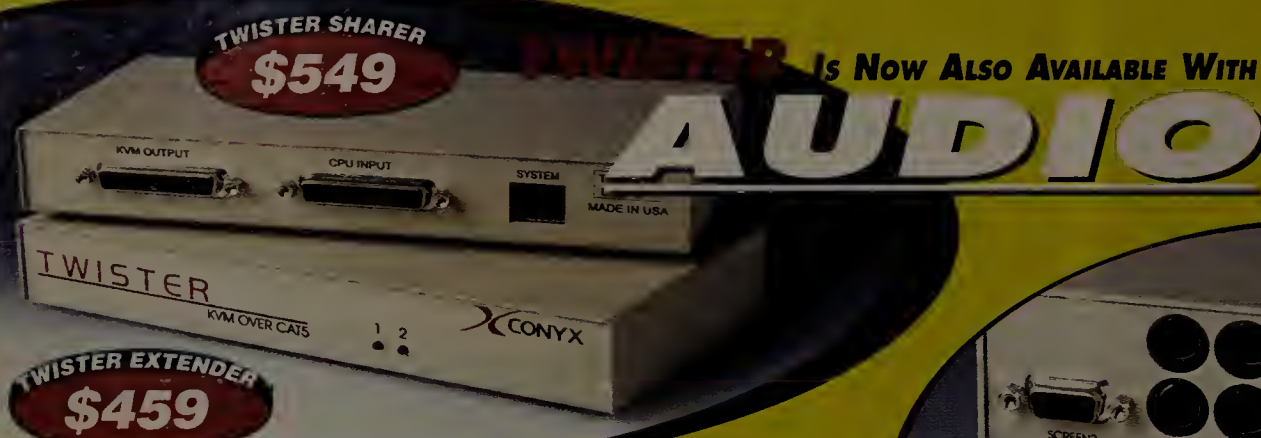
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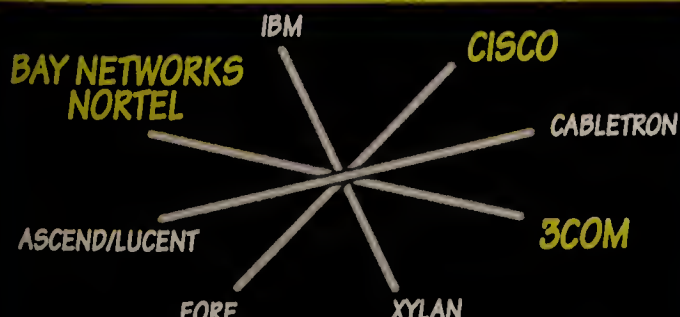
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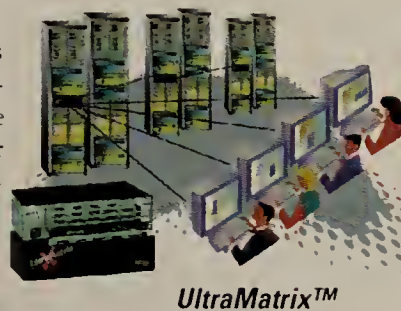
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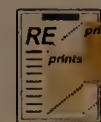


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Cisco unwraps enhanced WAN management tools

Available later this month, the suite addresses router optimization, connection responsiveness.

BY JIM DUFFY

SAN JOSE — Network administrators should be better equipped to ensure the optimal performance of their router-based networks with an enhanced suite of management tools introduced by Cisco last week.

The CiscoWorks2000 Routed WAN Management Solution includes applications for network access security, router optimization, connection responsiveness and traffic statistic analysis. Specifically, the suite's components include:

- Access Control List Manager 1.1, which Cisco

says provides simplified administration of access control lists for improved traffic filtering and device access control.

- Internetwork Performance Monitor 2.0, which is an application used to identify network bottlenecks, provide analysis of response times and determine device availability.

- TrafficDirector 5.7.2, an application designed to give network managers early visibility into potential WAN problems before they pose a threat to service interruption. When the application is used in conjunction with Cisco WAN probes, network managers gain end-to-end net-

work monitoring capabilities, Cisco says.

- Resource Manager Essentials 3.0, Web-based applications that provide network inventory and device change management, network configuration, software image management, network availability and syslog analysis.

- CiscoView 5.0, a new Web-based version of the company's application for enabling network managers to access real-time device status as well as operational and configuration functions.

- CiscoWorks2000 Management Server, which consolidates management services and provides a Web-based

console for integrating and accessing Cisco and third-party management tools.

The Waterbury Hospital in Waterbury, Conn., is banking on Cisco's improved software to help the facility come into compliance with the Health-care Insurance Portability Accounting Act (HIPAA) of 1996.

"The security required in HIPAA is draconian," says Jim Olson, Waterbury Hospital's chief information officer. "I say that because [these requirements are] going to affect all of the networking and all of the patient care systems that we in health care are currently running.

Many of the functions that now are becoming available within CiscoWorks are functions that we are desperately going to need in order to meet the HIPAA security regulations."

Cisco's enhanced software, which will be available later this month for Solaris and Windows NT systems, costs \$15,000.

Cisco: www.cisco.com



Oracle to make ambitious e-comm play

Graphical tools in XML-based server will allow applications data to be shared.

BY JOHN COX

LOS ANGELES — The "integration server" being unveiled by Oracle this week is a key part of the company's effort to make its software the heartbeat of corporate e-commerce.

Oracle Integration Server (OIS), which will be trumpeted at Oracle OpenWorld '99, is a set of development tools, server programs and consulting services that will let an array of applications share data via XML.

Oracle's strategy is to use OIS to help customers simplify the laborious process of setting up electronic shop. E-commerce typically involves tying together a federation of new and existing applications, some of which may be owned by trading partners, such as parts suppliers and shippers.

With OIS, companies will be able to use graphical tools to set up specific interactions among applications. OIS server programs will then execute this business process, set up

the connections among applications so they can share data, and keep track of what's happening.

All this can be done without changing existing applications, says Thomas Kurian, vice president of Oracle's e-business program. Special programs called adapters translate an application's data into an XML-based format. OIS server programs manipulate the data as needed and send it to other applications. There, an adapter converts the application's data from XML into the receiving application's native data format.

"Oracle is creating a general-purpose integration engine," says Roy Shulte, an analyst with Gartner Group, a Stamford, Conn., market research firm. "It's a very ambitious, full-featured product," he says.

One strength of OIS is its blending of synchronous and asynchronous communications.

"If you want a very interactive Web application with a two-second or less response time, then synchronous com-

munications will give you that," he says. "And behind the scenes, asynchronous connections let you process an order over 10 different applications spanning three days."

A related strength, Shulte says, is how OIS sets up this workflow. The graphical tools let administrators define a business process, such as placing a new order, that can involve several applications at different locations, even at different companies. The OIS workflow program then coordinates and tracks the execution of this process.

Shulte says one potential drawback is that OIS depends on the Oracle8i database. Companies that rely on a different brand may balk at bringing in the Oracle product.

OIS will compete with similar integration products from a small group of vendors, including Active Software, New Era of Networks, Tibco Software and Vitria Technology.

Now in beta testing, OIS will ship in December. Pricing will be announced this week. ■

IPv6,
continued from page 7

who works for the University of Tennessee. "It's a breakthrough because it deals with the tough nut of the ISPs. It gets around the fact that the core of the 'Net is not going to update to IPv6 for some time."

With 6to4, network managers can assign IPv6 addresses to all of their users and devices that access the Internet. The protocol, which resides on a router at the edge of an IPv6 network, assigns a prefix to each IPv6 address to identify it as a 6to4 address. The protocol then automatically sets up a tunnel over IPv4 to carry communications to other users with IPv6 addresses. Without 6to4, network professionals would have to manually configure these tunnels, which would be difficult and time-consuming.

The 6to4 protocol also helps resolve some of the application problems that net managers run into with NAT devices. For example, the IP Security protocol, which doesn't work well through NAT devices, will work fine with 6to4, proponents say.

"6to4 is very important," says Alain Durand, co-chair of the Next Generation Transition Working Group and a research engineer at IMAG in Grenoble, France. "6to4 will be attractive

to big companies with many different sites and deployed NAT boxes. If you use 6to4, you can reinstall end-to-end connectivity that you lost because of NAT. . . . Also, the cost of NATs gets higher and higher. This is one way to get rid of NATs."

Durand adds that he "doesn't see any opposition to 6to4."

May arrive next year

Currently in early draft form, 6to4 is expected to be approved as a proposed standard in the next few weeks. If it makes progress as a standard, 6to4 would likely be supported in router software later next year.

While 6to4 allows IPv6 users to talk to other IPv6 users over an IPv4 backbone, other protocols including NAT Protocol Translator support communications between IPv6 and IPv4 users. Also in development by the IETF is 6over4, which handles communications between IPv6 users on a LAN running IPv4 multicast.

"We have all the solutions for a local intranet running IPv6," says Erik Nordmark, IETF's Internet area director and an engineer with Sun. "Now we're looking at solutions for communications out over the Internet. . . . 6to4 is the only proposal we have for that right now." ■



ASP,
continued from page 7

a three- to five-year contract with an ASP and then grows quickly, outsourcing needs may change. Bringing that ASP application back in-house might then seem like a good idea, but it also might not be possible if buying a new software license is required.

Oracle Business Online, which is offering businesses Oracle's ERP and CRM hosted application services, always leaves application ownership with its customers. Oracle is taking this approach because it's going after small to mid-size businesses, which could see their outsourcing needs change quite a bit in just a few years.

"We wanted to offer customers the flexibility to take the application in-house in the future or take it to another provider, which is easily done if you own the license," says John Repko, vice president of operations for Oracle Business Online.

But what Oracle Business Online doesn't offer is appli-

cation customization. While Oracle Business Online lets its customers configure their software, it doesn't allow them to change the source code of the application. This condition does not exist with USi, QCS or Sprint and Deloitte. In fact, Sprint and Deloitte are specifically targeting Fortune 500 companies, which typically do not deploy ERP or CRM applications without a fair amount of customization.

Customization for all?

Tailored services aren't necessarily out of reach for smaller businesses. There are ASPs that target certain market segments, primarily in the high-tech arena, offering predefined application configuration and customization.

Applicast, AristaSoft, Corio and Surebridge all target business users in specific industries. Applicast, which offers SAP and Siebel applications, is going after mid-size companies in the manufacturing, software or high-growth Internet-based .com businesses.

AristaSoft and Corio are going after similar customers. Surebridge also has its hat in the high-tech arena but says



Second in a four-part series.

it's targeting manufacturing and professional services firms such as advertising and public relations agencies, too.

"These ASPs have pooled all of their knowledge and developed templated versions of an ERP or CRM application," says Asha May, an analyst at Dataquest, a San Jose consulting firm. "If they can truly create best-of-breed configurations and customizations, then it will be an effective service."

To offer business users an added level of comfort, ASPs such as Applicast, AristaSoft and Surebridge have aligned themselves with well-known network service providers.

Applicast is working exclusively with GTE, which hosts Applicast's application hosting servers in its Tampa, Fla., data center. Applicast also recommends to its customers that GTE provide their dedicated Internet access or data services. Yet, business users can buy their Internet, frame relay or private-line services from another provider. Surebridge has set up a similar relationship with AT&T.

AristaSoft, on the other hand, is collocating its application servers in Exodus Communications data centers, and is teaming with Covad Communications to provide the connection between its customers and application servers.

In nearly all cases, AristaSoft recommends that customers use Covad's digital subscriber line (DSL) services to access their applications. AristaSoft is the only known ASP that has teamed with a DSL service provider to meet its customers' network service needs.

While analysts believe that teaming with one service provider will probably not be a huge selling point with customers, some users may find comfort in knowing that their sensitive financial or human resources information will be traveling over a reliable network.

One thing that all of the ASPs mentioned have in common is that they are setting up dedicated application servers in a private data center. Users can typically access the servers through the Internet, a frame relay link or a dedicated private line. But the servers do not sit on the public Internet.

That's not the case with portal ASPs such as Agillion and Microsoft's bCentral. Agillion, a new ASP in Austin, Texas, is rolling out a CRM application hosting service that users sign up for through Agillion's Web site. The application was designed by Agillion and is only available in beta format. Customers are issued a user ID and password so they can securely access stored information.

Microsoft last week announced that it is making its Microsoft Office 2000 suite of applications available through its bCentral small-business user Web site. Microsoft was short on details but did say its offering is slated for general availability in the first quarter of next year.

One of the benefits of Agillion's and bCentral's business model is that users should be able to access their information from anywhere they can access the Internet. It's likely that portal ASPs will attract small-business users, The Yankee Group's Runyan says.

But portal ASPs will have to offer small-business users something more than an application they can buy off the shelf, he says. Small-business users will be looking for some kind of value-added service that offers them a new or better way to conduct business.

Whether portal-, enterprise- or industry-focused, business users need to understand that not all ASPs are created equal. It's like Granny Smith, Macintosh and Delicious: They're all apples, but each has a distinct flavor.

Next week: Tips from real-world ASP business users.

A wide assortment of ASP models

Trying to figure out what the various application service providers (ASP) do and how they do it can be difficult. Here's a breakdown to help sort things out:

ASP	Applications	Client/network access	Customer focus
Agillion www.agillion.com	Agillion-developed CRM (beta)	Web site/public Internet	Small business users
AristaSoft www.aristasoft.com	JD Edwards OneWorld ERP	Citrix thin client/DSL	High-tech businesses
Corio www.corio.com	PeopleSoft and Siebel	Fat-client, thin-client future/Internet, frame relay, private line	High-tech, start-ups, and .com businesses
FutureLink* www.futurelink.com	Onyx, Great Plains	Citrix thin client/Internet, frame relay, private line	Small to mid-size business users
Microsoft bCentral www.bcentral.com	Microsoft Office 2000	Web site/Internet	Small business users
NaviSite* www.navisite.com	InvoiceLink, Informative, Alive.com	Standard Web browser/Internet, frame relay, private line	Small to mid-size business users
Oracle Business Online* www.oracle.com/businessonline/index.html	Oracle ERP and CRM	Oracle Web-enabled client/Internet, frame relay, private line	Small to mid-size business users
Qwest Cyber.Solutions* www.qwestcyber-solutions.com	SAP, PeopleSoft, Siebel	Fat client/Internet, frame relay, private line	Variety of business users
Surebridge www.surebridge.com solutions.com	Baan, Great Plains, PeopleSoft	Citrix thin client/Internet, frame relay, private line	Professional services, high-tech manufacturing firms
USinternetworking www.usinternetworking.com	Siebel, Microsoft Office 2000, PeopleSoft, Broadvision	Fat client/Internet, frame relay, private line	Variety of business users

*ASP customers own actual applications. All other providers own the applications they lease. Additionally, all ASPs listed manage their own applications, except for NaviSite and FutureLink.

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Nortel opens up routing code...again

Open IP Environment to Internet-enable appliances, set-top boxes and low-end access gear.

BY JIM DUFFY

SANTA CLARA — Nortel Networks is licensing its routing code in an attempt to bring Internet access to the masses at an affordable price and to try to upset Cisco's momentum as the leading supplier of Internet routers.

Nortel last week announced the so-called Open IP Environment, routing code that is separated from router hardware and offered to hardware manufacturers for a licensing fee. Nortel also says it is reducing the price of its Bay AN and ARN access routers by as much as 50%.

Open IP Environment includes the Open Shortest Path First routing protocol and APIs so licensees can add security, tunneling, policy and accounting features, among others. The software is intended to "Internet-enable" a variety of servers, personal computers, mass-market appliances, mobility devices, set-top boxes and processors, thereby freeing users from the requirement to buy a router for Internet access.

Indeed, Nortel says it expects the Open IP Environment software to drive the shift away from "expensive and complex 'Old World' router hardware" to low-cost "New World" routing that is widely available to the industry and can be embedded directly into servers, processors and devices. Nortel's reference to "Old World" routers is a thinly veiled swipe at Cisco's tradition of selling routing software only with its expensive routers.

To date, Nortel says it has sold 200 licenses of the Open IP Environment to 75 companies. Two of those companies are Intel and Microsoft, which plan to incorporate the code into programmable silicon and operating system soft-

ware, respectively.

The practice of licensing routing code is not new, however. Small companies such as Phase2 Networks and Wind River Systems have been licensing routing software for years, analysts say. And Cisco licensed its IOS routing technology to hub and switch manufacturers years ago, but in keeping with its

reducing the price of routing, he says.

For its part, Cisco appears to be unfazed by Nortel's Open IP Environment pitch.

"Price is not the No. 1 or No. 2 criteria" for selecting a router or router vendor, Cisco CEO John Chambers said during a conference call with Wall Street analysts last week. "We've seen



"What we've done is take that preliminary routing code and modularize it, streamline it, tune it up and turbocharge it so it's higher performance..."

Bill Conner, president, Nortel's Enterprise Solutions business unit

hardware requirement only offered the software bundled with a router module.

In fact, Open IP Environment is Nortel's second attempt at licensing routing code. Bay Networks acquired Phase2 17 months ago and shortly thereafter announced a licensing program for its BayRS code. Nortel announced plans to acquire Bay a week before Bay announced its BayRS licensing program.

Nortel officials acknowledge that Open IP Environment is essentially a recast of the BayRS licensing plan.

"It's the next generation of that capability," says Bill Conner, Nortel executive vice president and president of the company's Enterprise Solutions business unit. "What we've done is take that preliminary routing code and modularize it, streamline it, tune it up and turbocharge it so it's higher performance."

But some analysts are less than impressed with Open IP Environment.

"I think it's mostly marketing," says Craig Johnson, principal at The PITA Group in Portland, Ore. "They're re-announcing something they announced almost two years ago, and they made no inroads during that time. What they're trying to do is pull a card out of Cisco's deck where Cisco right now is trying to use this 'open' pitch against the likes of the Old World" telecom companies such as Nortel.

Johnson says that regarding routing in end-user devices, such as appliances and set-top boxes, there are more fundamental issues, namely manageability and scalability. As more intelligence spreads farther out to the network edge, managing that intelligence and scaling performance become more critical than


[Nortel] aggressively price in many of our accounts and that, in many situations, has not changed the [user's purchase] decision process. I do not think that will make a major difference in the market."

Added Cisco Executive Vice President Don Listwin during the same conference call: "I characterize it as sleeves for a vest. It really isn't something that the market has demanded or wanted. I view this as [Nortel] exiting the access router market, which is fine with me."

Citing data from International Data Corp., Nortel says the worldwide market for routers is currently \$7 billion. It has the potential to reach \$25 billion by 2003, Nortel's Conner says.

Users welcome the price cuts on Nortel access routers but say they are still hashing out the Open IP Environment plan.

"The trend toward openness is good," says Brett Frankenberger, telecommunications engineer at Union Pacific Railroad in Omaha, Neb. "But I'm still a little lost. High-performance routing on a little palm device... I'm not sure what it all means." ■

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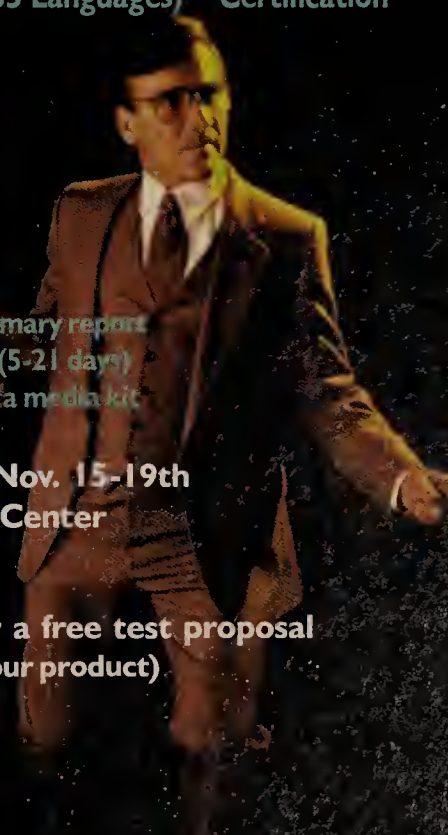
This week's question:

How much is the U.S. Government Printing Office charging for a printed edition of Judge Thomas Penfield Jackson's "Findings of Fact on Microsoft"?

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How to be completely wrong

ind game time! Here's the scenario: Let's pretend you play basketball. You are so good at basketball that you can force any play on the court. Even better, your team wins all the time and you make a gazillion dollars per year. Your name might be, oh, say, Michael Jordan.

Question: Should you be penalized for this success? Are you unethical for using your skills? Should we put weights on your feet to "level the playing field"? (And yes, I do know Kurt Vonnegut's short story *Welcome to the Monkey House*.) Most right-minded people would say, "No, that wouldn't be reasonable — it wouldn't be ethical."

But it seems this is exactly what many people want to see happen to Microsoft. The situation has become very emotional, and you can hear the choruses of "Hobble 'em," "Break 'em up," and "Put Mark Gibbs in charge."

And as if to satisfy the ravening hordes, the federal judge in the Microsoft anti-trust case recently held that Microsoft is, indeed, a monopoly.

That decision paves the way, potentially, for breaking up the company.

I would suggest that the finding is completely wrong. I don't mean legally wrong — the finding may, indeed, be completely defensible from the point of precedent. However, the key question is, does the finding make sense?

In my previous column on this topic, I argued that antitrust laws have never been in the public interest. They were concocted to clip Rockefeller's wings when his company, Standard Oil, became unacceptably rich and powerful.

Now there is an interesting parallel here: Rockefeller was accused, quite accurately, of what he himself referred to as "predatory competition." This was the practice of selling under cost to drive a competitor out of the market. It was a tactic the Standard Oil Company employed to great effect.

I think there's little doubt that

Microsoft has been equally guilty of predatory competition, particularly in the area of forcing deals by financial muscle and implied threat, as well as duplicating technologies and bundling them with product so smaller companies have to secede their markets. Sure, such behavior isn't nice, but who is in it to be nice at the expense of their business? Now is this behavior unethical and, more crucially, is Microsoft a monopoly? I don't think so on either account.

What we have here is Microsoft being simply a better (and luckier) player. They are good businessmen, and they are operating in accordance with the rules of the free market. Note that idea: a free market. Not a planned political economy. Not a communist state. A market in which innovation and competition are to be fostered and applauded, and where the market gets to vote — with its dollars — who is the best. Where being nice is an option.

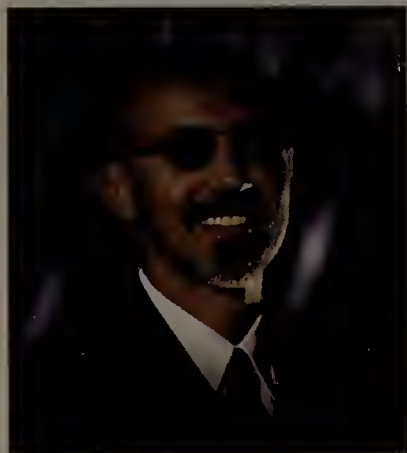
The issue of whether Microsoft is a monopoly is crucial. Standard Oil was dealing with real, physical products: oil and kerosene. That is remarkably different from dealing with ideas — which are the essence of software and the foundation of Microsoft's business.

Here then is the issue: A business founded on ideas can't be treated like one founded on "stuff." Businesses in the ideas world move too quickly. Their markets are too fluid for legislation to keep track of, let alone control.

And if the courts force Microsoft to break up, it won't change anything. Microsoft in two, three or four divisions will be just as powerful as when they were together. The essence of Microsoft lies in the people and their ideas, not in manufacturing stuff.

Worse still, the issues that define the case today will be ancient history by the time a full judgment is handed down, and Microsoft will be a different company. The judgment will be wrong. You want to see how wrong? Just wait. Whatever we do to Microsoft won't matter a damn within the next couple of years.

Break it up to nwcolumn@gibbs.com.



MARK
GIBBS



The latest on the
Internet/intranet industry

There's a temptation to declare this space a Microsoft-free zone this week, given the nonstop news, analysis and drivel that has followed Judge Thomas Penfield Jackson's finding that Bill Gates and his minions are evil incarnate. However, the Union of Trade Rag Columnists would yank my membership card if I didn't offer up at least a McNugget or two of opinion on what has transpired.

So here goes: Not much has transpired.

Despite all the hoopla and pontification from the press, you won't be seeing Open Source Windows, a slew of regional Bill operating companies or Gates himself being hauled away in leg irons any time soon... as in, oh, let's say the next two to three years. (Quick: What's that translate to in terms of "Internet years?")

The grinding wheels of justice work to Microsoft's benefit in this case, and you can expect the software bully's lawyers to be tossing sand into the gears of the 98-pound legal system at every opportunity. Just as greed was good for Gordon Gekko in "Wall Street," delay is dandy for Bill Gates in Washington, D.C.

The more time passes, the less chance any of the doomsday scenarios will befall Redmond. Not only will the competitive landscape continue to rock 'n' roll in ways that make Microsoft look more like The Monkees than Marilyn Manson, by 2002 there won't be much appetite anywhere for punishing the company's alleged misdeeds of the long-ago 1990s.

Which isn't to say Microsoft won't choose to settle on less onerous terms, should the government see clear to broach a reasonable deal. Much has been written this past week to the effect that Gates and his lieutenants are blinded by their own dogma, meaning they are literally incapable of giving ground or swallowing their pride to end this fight short of an uncertain Supreme Court decision.

That's nonsense. Gates may be arrogant, stubborn and ruthless, but he did not become the world's most powerful businessman by being stupid. He's not David Koresh, and Microsoft is no cult. Gates will do what's best for the company, even if it makes his skin crawl.

Right now delay looks to be best for the company.

Alex and Brian Meshkin are entrepreneurs/brothers who intend to launch their Surfbuzz.com portal site next month with a management team made up of Coca-Cola expatriates. The Meshkins seem to be likeable fellows, despite their brazen theft of my beloved "buzz" tag and the fact that their combined ages roughly equal mine alone.

Here's the idea behind Surfbuzz.com: Users of the portal will accumulate BuzzPoints by doing normal activities such as e-mail, chat and checking stock quotes. BuzzPoints will be the only currency allowed when Surfbuzz.com auctions off a variety of goods and services — ranging from cars, computers and vacation trips to "evenings with celebrities." (OK, minds out of the gutter, people.) Surfbuzz.com's advertisers and partners will provide the auction items.

"One day I was driving down the road and said, 'I've got it: We'll give away everything for free'" through "a points-based auction model," says 19-year-old Alex.

What was big brother's initial reaction? "I actually thought that he had lost his marbles," says 23-year-old Brian.

A full accounting of those marbles will have to wait until [Surfbuzz](http://Surfbuzz.com) launches. While the scheme does have that trendy "something for nothing" appeal, the pitfalls are not difficult to spot. For example, the early joiners and most zealous [Surfbuzz](http://Surfbuzz.com) junkies could accumulate so many points — 1,000 a pop for signing up others — that "normal" users will have little chance to land valuable auction items.

The Meshkins acknowledge that they'll have to work to make everyone feel like a winner.

Of course, if they fail, they'll have plenty of years left to try again.

Gratitude alone will be your reward for sending Internet news tips to McNamara at buzz@nwu.com.



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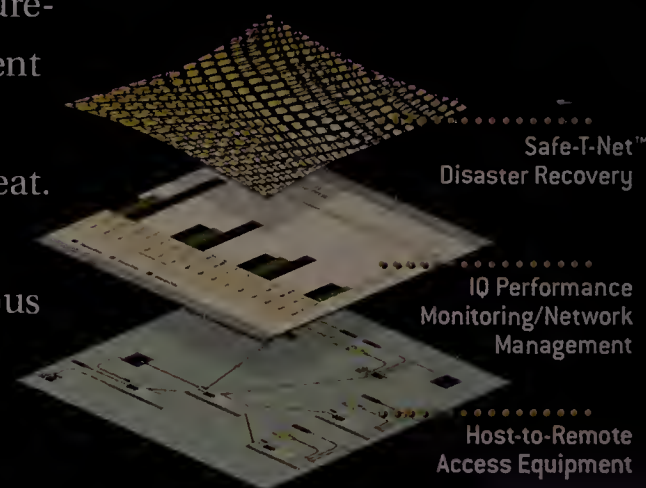
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